December, 1938
Vol. 27, No. 10

INDUSTRIAL ARTS and VOCATIONAL EDUCATION

St. Louis—The Convention City

G. H. Hargitt

Supervisor of Manual Training
St. Louis, Mo.

Historical, industrial, civic, and educational St. Louis.

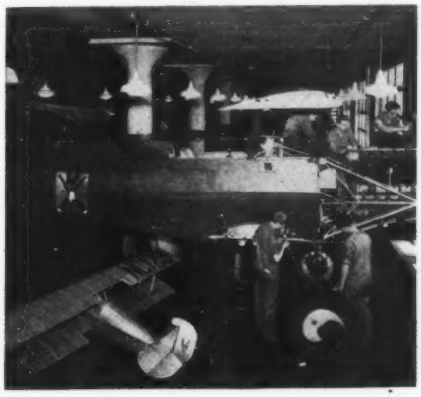
When members of the American Vocational Association meet in St. Louis, situated on the banks of the "Father of Waters," from November 30 to December 3, they will be in a metropolitan area that early in its history was governed within a span of a few hours by three different nations. St. Louis was founded by a band of French explorers. Its government was changed to Spanish rule, then back to the French. Through the wise negotiations of Thomas Jefferson, it became United States territory through the Louisiana Purchase.

St. Louis is internationally famous for its manufacture of brewed and tobacco products, clothing, flour milling, furs, leather tanning, shoes, and smelting and refining.

Because of these numerous and diversified types of interests, there is no lack of places to visit nor things to see in the brief time allotted for that purpose immediately before and after the convention, as well as between the meetings of the several sessions.

The Art Museum

Ranked as one of the four best art galleries in the United States, the museum contains rich exhibits of paintings, casts, sculpture, marbles, bronzes, drawings, architecture, and applied arts. Many rare canvasses are here, exemplifying the famous work of the old masters. The collection of Chinese bronzes, ceramics, and paintings is one of the finest of its kind. The Ballard collection of prayer rugs in itself is well worth a trip to the museum.



Airplane mechanics. Hadley Vocational School

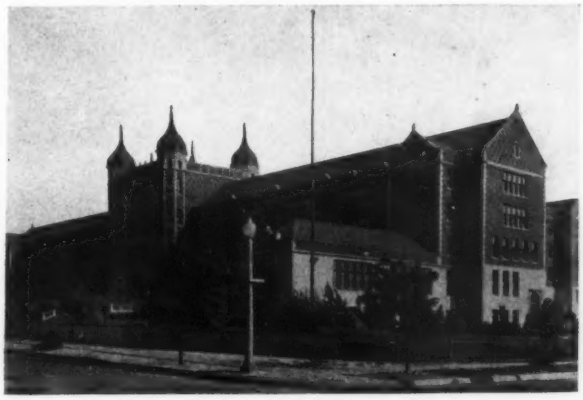
St. Louis is one of the few cities in the United States which fosters the development of artistic and cultural facilities for the public by a direct tax for the maintenance and development of its art museum, thereby making superior advantages of this kind available to everyone.

Shaw's Garden

Founded in 1860 by Henry Shaw, a St. Louis philanthropist, the Missouri Botanical Gardens, popularly known as Shaw's Garden, ranks second only to the famous Kew's Gardens of England. It contains the largest collection of plant life in the Western Hemisphere and is famous the world over for its wealth of botanical species and its beautiful floral displays. Undoubtedly the famous chrysanthemum show will be on display to the public at the time of the convention. The garden comprises a city tract of about seventy-five acres, an out-of-town extension of more than 1,600 acres, and a tropical extension at Balboa, Panama.

Jefferson Memorial

With aviation claiming so important a place today, visitors do not consider their visit to St. Louis complete without first seeing the famous Lindbergh collection, including gifts, medals, trophies, and souvenirs from practically every foreign country and from thousands of other sources. Colonel Lindbergh, a former loyal St. Louisan, has chosen the Jefferson Memorial, with the Missouri Historical Society as custodian, as the permanent resting place for the mementoes which have come to him in connection with the epoch-making flight of the "Spirit of St. Louis" across the Atlantic, and his tours



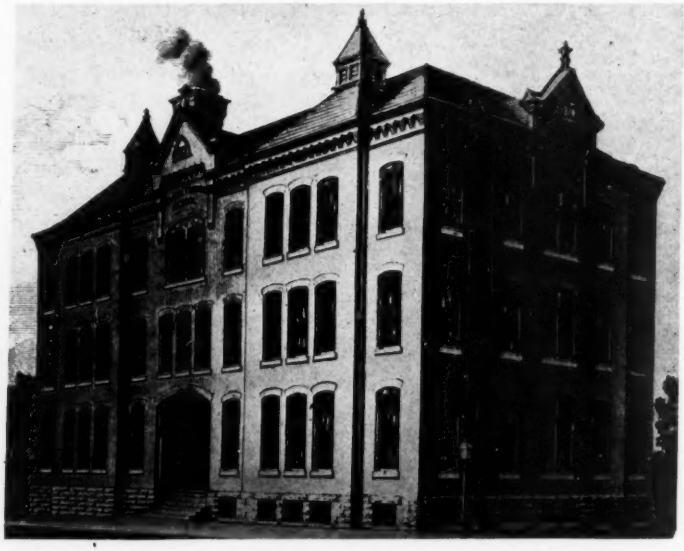
Roosevelt High School. Students attending this school may elect industrial-arts and technical courses

Hadley Vocational School

of friendship to the countries of Mexico, Central and South America.

Lambert Airport

The Federal Government has seen fit to select the St. Louis area for its general headquarters of the Army Air Service. The city is surrounded by private, commercial, and army airports. Lambert Field, a municipally owned airport, located a short distance from the city limits, is second to none in size and in modern equipment. Airplane factories are located along the borders of the field. These industries offer excellent opportunity to observe the construction, testing, and flying of modern sailing crafts that are built for private and commercial use. Then, too, there is opportunity to observe the huge transcontinental transports as they pause on their trips across the continent. These may be seen any day by making a trip to the airport.



Calvin M. Woodward's old school located at 18th and Washington Avenue. Used from 1879 until classes were moved into the new building in 1905

The Old Court House

At the corner of Broadway and Market Streets stands the "Old Court House," a century-old historic spot from whose east door slaves were auctioned in *ante bellum* days, along with other personal property. The stone auction block may still be seen, also the prison cells in the basement, and the courtroom in which Dred Scott's famous case for freedom was begun. This court house was the starting point of many expeditions to the west. Among them one of the best known was the Lewis and Clark expedition that opened the Northwest territory.

This famous old building is in the immediate vicinity of the world's fur market. Daniel Boone, Emanuel Liza, and John Jacob Astor were known to frequent this vicinity in the early fur-trading days. Although the quest of fur-bearing animals has shifted, St. Louis is still the raw fur market of the world.

Space will not permit our describing further the numerous things to be seen and enjoyed when you visit our city.

Education

It is quite fitting that the American Vocational Association should honor St. Louis at this time and participate with us in observing our century of progress in Education. Just one hundred years ago the first free public school was opened to the children of this city. From that small two-room school the system has expanded to include 143 elementary schools, five prevocational schools, two vocational schools, ten high schools, two junior colleges, and two teachers colleges. All of these are operated under the direction of the Board of Education.

Washington University, St. Louis University, Concordia Seminary, Eden Seminary, and the David Ranken School of Mechanic Arts, located in this community, are operated under the control of private corporations.

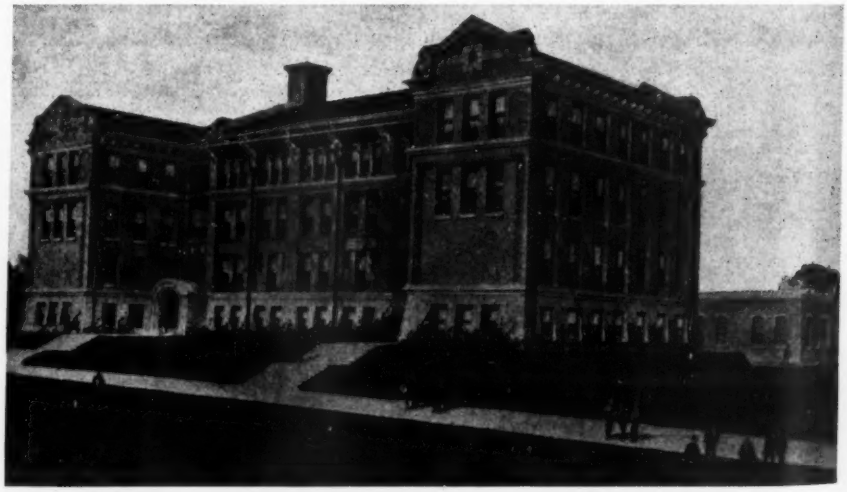
Calvin Milton Woodward

Before attempting to mention industrial education in the St. Louis schools as it is at the present time, it is only proper that we honor the man who made these subjects possible in our public schools.

Calvin Woodward was Dean of the College of Engineering and Architecture of Washington University. But in 1879 he accomplished his most important work as originator and director of the St. Louis Manual Training School. This private school for boys, opened under the auspices of Washington University, attracted world-wide attention almost from its inception. This school, based on a foundation of general education at the scholastic level of the public high school, became the leading educational experiment of its time and was the model for similar schools to be established in other cities shortly thereafter. The purpose of this institution might best be described by the famous motto inscribed over the door of the old school at 18th & Washington Avenues:

"Hail to the skillful cunning hand!
Hail to the cultured mind!
Contending for the world's command,
Here let them be combined."

Dr. Woodward was a member of the St. Louis Board of Education from 1877 to 1879, and from 1897 to 1911, serving



Calvin M. Woodward's New Manual Training School showing shops in rear. This building was built on Enright Avenue and Windemere Way in 1904 and closed 1915. It is now Blewett High School, part of the St. Louis school system

as president of that body for three different years.

At a meeting of the Board of Education on November 9, 1897, Dr. Woodward offered a resolution that a committee be appointed to "inquire into the matter of manual training and . . . upon the extent to which manual training has entered into

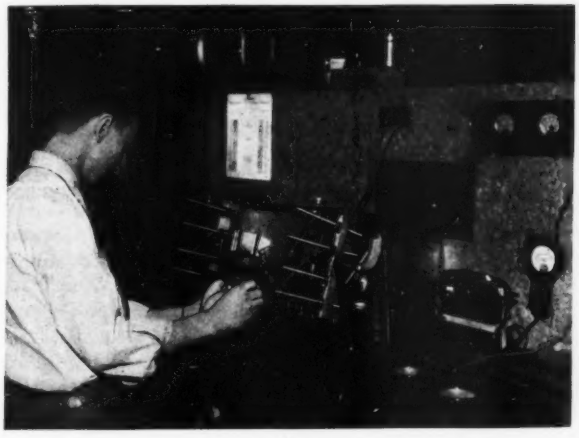
ability of accepting credit for manual training for entrance into the colleges of their association while Dr. Woodward served as president of that body.

Private funds were first donated to experiment with this new form of school activity. These experiments were conducted for two years before the formal

minutes daily and are accepted for college-entrance credits for those planning to enter college. Industrial arts in the cosmopolitan high schools is offered as part of general education, with a technical emphasis.

Those children desiring to pursue industrial education for vocational purposes are given the opportunity of specializing in

Above, motor testing, auto-mechanics class Hadley Vocational School. Right, shoe-pattern drafting class, Vocational Technical Extension Evening School



Electrical-testing radio class. Vocational School

Prevocational boys in 9th-grade building trades try out brickwork

American education, and upon its educational value." If the committee found it worthy of consideration, they should submit a plan for including it in the St. Louis schools.

On April 12, 1898, this committee, with Dr. Woodward as its chairman, presented a voluminous report comprising investigations of all cities of any consequence in this country and in Europe as well, and recommended that as soon as means would permit, manual training should be included in the elementary and high schools of the city. Manual training was made a part of the regular work of the district schools by action of the Board of Education beginning with the year 1899–1900.

It might be observed that the North Central Association of Colleges and Secondary Schools first recognized the advis-

adoption of the work.

Today industrial arts is required of all boys in the seventh and eighth grades of the elementary schools. Work in these classes is in the nature of a general shop program. Children have opportunity to work with wood, metal, and electricity for a period of ninety minutes per week in modern, well-equipped shops.

In the cosmopolitan high schools industrial-arts subjects are elective. Courses are offered in such graphic arts as printing, machine and architectural drafting, and home planning. In the shop classes, automotives, as a consumer course, is offered together with the more technical work in machine practice, heat treatment of metals, cold metal work, patternmaking and molding, and woodworking activities.

These courses are offered for ninety

their chosen fields. Two well-equipped modern vocational schools and five prevocational schools are provided for that purpose. The Hadley Vocational School for white students is located at 3405 Bell Avenue. Booker T. Washington Vocational School for colored students is located at 814 North 19th Street. One of the largest of the cosmopolitan schools, Roosevelt High School, is located at 3230 Hartford Street.

Both the vocational schools and the high schools are open from 7:30 to 9:30 p.m. four days a week for evening extension education. The evening schools are for those who have severed their relation with the day schools but desire to continue their education. Types of all of these schools will be open for inspection during the convention. Visitors are welcome.

Leaders in Industrial Arts and Vocational Education in Missouri

G. W. Hargitt, Supervisor Manual Training, St. Louis, Mo.

C. L. Wetzel, Vocational Teacher Trainer, Hadley Vocational School

Fred Jeffery, Assistant Superintendent of Schools, St. Louis, Mo.

R. W. Selvidge, Department Industrial Education, University of Missouri

Vocational Education in St. Louis

Catharine Gunn

St. Louis, Missouri

An invitation for A.V.A. visitors to see the David Ranken Jr. School of Mechanical Trades, located at 4431 Finney Ave., not far from convention headquarters, has been extended by M. Reed Bass, its director.

In founding the school in 1907, David Ranken said: "I am satisfied that there is need for an institution the object of which shall be education and instruction in the ordinary mechanical trades and in which boys, especially, may be taught the dignity of labor. I have therefore formed the intention of endowing an institution in which boys and men may be trained to habits of industry and economy, and taught such mechanical trades or handicrafts as may be suited to their several capacities, so that they may become useful citizens and be better fitted and enabled to support themselves by the labor of their own hands."

At present, the school offers both day preparatory and evening extension classes. The annual enrollment in the day school is approximately 560 students and in the evening school 1,600. Only white, male students are accepted. Entrance requirements are an eighth-grade education and a minimum age of 16 years. A large percentage of day-school students are high-school graduates. All day courses are two years in length, with the exception of welding, which is offered as a special course. Instruction is offered in the following trades: Air conditioning, automobile repair, carpentry, mechanical and architectural drafting, electricity, machine-shop practice, painting and decorating, pattern-making, plumbing, radio, refrigeration, steam engineering, and welding. Related subjects include English, science, drawing, shop mathematics, and trade technical information.

The center of vocational education in St. Louis is unquestionably the huge Herbert S. Hadley Vocational School, built in 1931. This school covers more than a city block and has a total enrollment of approximately 7,000 of whom 3,454 are taking full daytime courses.

A.V.A. convention visitors at St. Louis are invited to study outstanding schools offering part-time and full-time vocational training.

Ninth-grade work, whether carried on at Hadley or at one of the ninth-grade centers conducted to relieve the pressure of enrollment at the parent school, follows a program of exploration and guidance. Pupils are given introductory courses so that they may discover and follow natural aptitudes. The factors of health and temperament, so often ignored, are

Student at work at test bench in refrigeration department

The Blow School in the southern part of St. Louis. In this building are located some of the 9th-grade preparatory vocational courses leading to entrance into vocational courses at the Hadley Vocational School

Painters' apprentices attend Saturday-morning classes at the Hadley Vocational School

Instruction in electric wiring is provided on a practical basis in the Hadley Vocational School

Evening-school student at Hadley Vocational School enrolled in short-unit trade-extension course

also considered in guiding students in the selection of a vocation. Although designed for boys and girls who are capable of profiting fully from secondary education, the school's program is flexible enough to offer special opportunities to those without the ability of finishing a regular four-year course.

When pupils reach the tenth grade they may select from nineteen trade and three commercial courses. The trade and industrial courses are: Aeromechanics, architectural drafting, arts and crafts, auto mechanics, cafeteria and tea room, commercial art, cosmetology, electricity, horticulture, industrial sewing, machine drafting, machine shop, painting and decorating, photography, printing, radio, sheet metal, show-card writing, and woodworking. The commercial courses are: General business, stenographic, and store service. A number of short business courses are offered to high-school and college graduates.

Part-Time Adult Education

Part-time and extension work for adults has always been recognized by those directing vocational education in St. Louis as one of the essentials of a well-rounded plan, and at present an extensive program is carried out on Saturday mornings, during weekdays, and in the evenings. Many courses have been arranged through the co-operation and active assistance of employer and employee groups.

Indentured apprentices form one of the largest groups participating in the part-time program. In all cases arrangements for their training have been made with locals of their respective unions, and instructors are men with actual trade experience as well as the necessary qualities for teaching.

Characteristic of this type of instruction are classes held at Hadley for carpenter's apprentices, which are attended by 70 young men for four hours each week on company time (they bring time tickets, as they would do on the job). Their teacher, who was a carpenter foreman, acts as craft co-ordinator visiting boys on the job, advising them and studying their needs as to classroom instruction. Apprentice machinists and aeromechanics also attend daytime classes at company expense.

Saturday Morning Classes

The idea of Saturday morning classes for those working in five-day-week trades is believed to be peculiar to St. Louis. At present, such classes are arranged for apprentices in painting, sign writing, machine-shop work, machine woodwork, and paper hanging. Hours are set from eight o'clock to twelve, but instructors say that many apprentices remain at the school much longer, trying out new methods and equipment.

Evening classes at Hadley are held for the following apprentices: glaziers, printers, sheet-metal workers, electricians, machinists, bricklayers, and wood patternmakers. In addition, evening classes in shop practice and mathematics for apprentices are held in three high schools.

Six evening courses in subjects related to the new training in distributive occupations are being given in high schools, while Hadley holds closed classes for those specifically employed in retail food merchandising, ceramics and glassware, and textiles.

Working with the Missouri State Employment Agency, Hadley conducts daytime classes for waitresses. (Other groups of waitresses are sent to evening schools by their employers.) The employment agency was also instrumental in establishing an evening class in aircraft installation which is the result of a definite employment need. Young men with some sheet-metal experience were selected by tests and those qualifying are being given a course of training set up with the assistance of the leading aircraft factory in the St. Louis area. Another course in aeromechanics is given on Saturday morning.

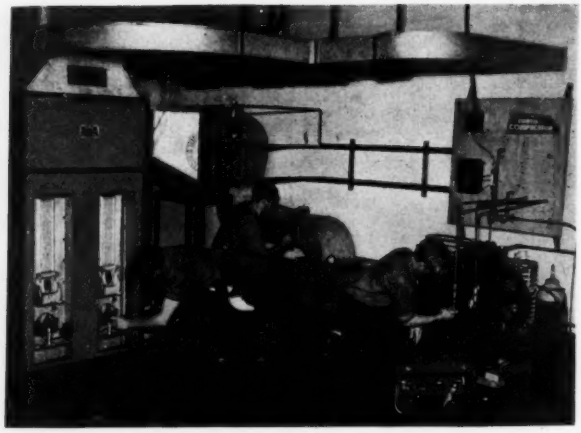
Last fall, through the co-operation of employer and employee groups, a new course in sewing straw braid was opened at Hadley. The course was given to a selected group of felt-hat workers, thus making possible their year-round employment in the millinery industry.

Aeronautics

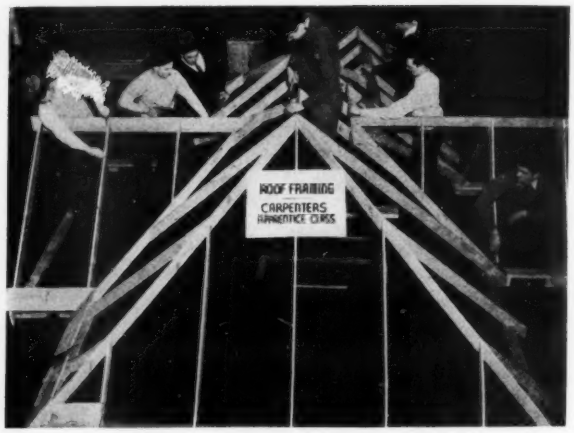
To care for an emergency need in its own factory, the Curtiss-Wright Airplane Company sponsored a class in principles of aircraft construction, in which college-trained men were given mathematics just below the college level by a teacher employed in the company.

Because many of its members were faced with the necessity of increasing trade knowledge to meet seniority rights, the Railway Carmen's Union sponsors two classes at Hadley. One is for studying simple principles of airbrakes, the other, annual changes in railway-car interchange rules.

The auto-mechanics department of Hadley was organized with the assistance of the Auto Club Service Men's Association (independent AAA garage owners) and the Service Managers Bureau (auto dealers' association). Through the co-operation of these groups as well as that of equipment manufacturers, special short-term courses have been offered in the late afternoons and evenings to men employed in the in-



Students at work in air-conditioning department



Carpenters' apprentices in the part-time division of the Hadley Vocational School

dustry. Special training programs, designed to take care of needs of certain car manufacturers, have been introduced in this way — for instance, classes in Chevrolet wheel alignment or in laboratory methods of studying Ford mechanics. Another type of short-term course offers intensified training in some phase of the work for which there is an urgent need. In this way, special instruction has been given in body and fender repair, motor tune-up procedure, fundamentals of auto electricity, and the like, For a limited group of men *actually engaged in servicing Diesel engines,* a short course is being given in Diesel service problems.

Recently, eight new arc-welding machines have been installed and part-time instruction is now available for partially employed metalworkers.

Within the last few years, St. Louis has become decidedly conscious of its smoke problem and new city ordinances have been passed to help control the annoyance. Spurred on by the popular interest in the subject, two organizations of power engineers (one of operating engineers, the other of boiler-room workers) have arranged classes for studying power-plant and boiler-room operation.

Efforts of the St. Louis Shoe Manufacturers Association to retain the city's reputation for style leadership in shoes has resulted in the creation of an evening class in shoe designing at Hadley. Thirty-five design-minded young men, at least partially employed in shoe styling, are being given a course to help them understand the practical problems of their business. Another in the long list of specially planned classes is the highly technical three-year course in interstate commerce traffic sponsored by the traffic club. The course, which is now in its eleventh year, was outlined by club officials and from time to time the organization supplies speakers who talk to the class on their specialties.

For many years the public-school system has provided classes in home economics for adults. Feeling that the older program in cooking, sewing, and millinery should be supplemented by courses which consider family problems in a broader sense, the board of education established the present program of adult family life education in 1934. Courses include such subjects as: Mental hygiene, food for the family, clothing for the family, home furnishings, how to buy, and remarkably popular classes in the psychology of successful living. This year, a capacity enrollment is reported in all evening classes as well as in those held during the day for mothers' circles and other interested groups.

Vocational education for Negroes is supplied at the Booker T. Washington Vocational School in which some 18 trade

Cabinetmakers' apprentice learning to use a tenoning machine in the well equipped millwork shop in the Hadley Vocational School. Layout and other technical subject matter is also taught the apprentices

A student in the sign-writing shop of the Hadley Vocational School executing a project for theater-lobby display. The scenery and stage settings for "The Ship" program for the 1938 AVA convention is being prepared in this shop

and industrial courses are offered to an enrollment of 535 students. Evening classes are held in electricity, painting, cosmetology, sewing, cooking, and auto mechanics. Exceptionally fine daytime courses are offered in power laundering, industrial sewing, and upholstery repair.

It has not been possible in an article of this kind to do more than briefly outline the work in vocational education being carried on in St. Louis. However, it is hoped that readers will have glimpsed enough of the variety and extent of the program to understand the importance of attending the A.V.A. convention.

Lessons for Young Workers—VIII

Thomas Diamond

Vocational Education Department,
University of Michigan,
Ann Arbor, Michigan

The eighth of a series of suggestive lessons designed to help students of industrial arts and vocational education.

Trading

The Indians of North America, the natives of ancient Britain, and before these the aborigines of still older countries, fished and hunted, and tilled just enough of the soil to enable them to subsist. Frequently the women did the work on the land, while the men supplied the meat and the fish. Their wants were few and each family or tribe was independent of the others.

A little later in their history some of these tribes traveled far from their usual haunts in search of new hunting grounds and encountered other tribes with unfamiliar customs, and strange implements of war and of the chase.

There was born in their minds a desire to possess these new weapons. To gratify this desire they had either to fight the strangers or find something that the owners of the weapons would exchange them for. In other words they had to find something which the other tribe wanted sufficiently to induce them to trade. Doubtless in these transactions arrows with flint points were exchanged for others with heads of bone, spearheads of bronze were exchanged for cows or goats, and many other objects were exchanged to the satisfaction of both parties.

Still later, the more civilized peoples of Europe came to Britain and America and brought with them many strange things which the natives soon learned to appreciate. To enable them to obtain these things it became necessary for them to trade, and very soon the natives were supplying meat and fish, and later on, hides and metals, and such things as they found the newcomers would accept in return for the strange things that the natives desired.

Thus from the earliest times the custom of trading has been practiced, and people satisfied most of their wants by obtaining the things they wanted from others in exchange for something which they had and which was wanted by the others.

As methods of transportation improved it became possible for different branches of production to be localized, with the result that different communities specialized in making the things that could be made most efficiently with the raw material and power at their command. Thus grew up the system of each community's making one, or a very few articles, in which they excelled, and trading them for articles which could be made more advantageously in some other community. As it was in smaller communities, so it is in different countries of the world. We find that the climate of some countries makes it possible for them to supply such commodities as rubber, coffee, tea or cotton, while the natural resources of other countries enable them to supply coal, iron, zinc, and tin. By means of trading, these countries import the goods they cannot produce, or do not wish to produce, and pay for them with those goods which can be obtained in abundance within their boundaries.

You will notice that in all these cases the people pay for the articles they receive with other articles which they possess. Now although this system was suitable when the wants of men were simple, it became quite inadequate as advancing civilization caused them to increase and become more complex. What people did to overcome the difficulties of this system will be taken up in another lesson.

The points to be made in this lesson are:

1. Trading goods for goods was the original method of buying and selling.

2. Both parties must want the goods they are receiving more than the goods they are giving before a trade can be made.

3. Before a person can obtain any article he wants he must find out the wants of the owner of the article. As soon as he discovers these, he must obtain the goods with which to satisfy them, in order to induce the owner to part with the desired article.

4. The quantity of goods necessary to induce a person to part with any article varies with his desire to keep the article.

5. The quantity of goods a person will give in order to induce a person to part with any article varies with his desire to obtain it.

Questions for Discussion

1. What do you know about the Hudson Bay Company?

2. What did they obtain from the inhabitants of the territory in which they established their stations? How did they pay for what they got?

3. Do you know of any articles the Indians desired from the early colonists? What had they to offer in exchange for these?

4. If the Indians had nothing that the colonists wanted could they have done any trading? Could they have done any trading if either side had been unwilling?

5. If an Indian gave six hides for a shotgun, did he buy it? How much did he pay for it?

6. If you trade your four-bladed knife for a fishing rod, is there any buying or selling in the transaction? How much is paid in each case?

7. Would you trade your bicycle for a scooter? For a motorcycle? For a locomotive?

8. What goods have to be obtained from abroad by the United States?

9. With what goods does the United States pay for these?

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1. The need for enrichment of content in industrial arts is sharper in the smaller schools than in the larger ones.

2. Terminology needs clarification.

3. There is sharp need for the development of the instructional methods, managerial plans, and shop plans implied in the inclusive classification "general shop."

4. There is need for a broader understanding of the contribution of industrial arts in the general education program. — From the *Wisconsin Industrial-Arts Bulletin*.

Marking and Reporting Student Progress

Dewey F. Barich

Longfellow Junior High School,
Flint, Michigan

Forms that may be found helpful in faithfully recording the student's progress.

The purpose of this article is not to sell any *one* system of marking and reporting student progress, but rather to sell the function of *all* the systems. In the article entitled "A Profile-Type Rating Card," which appeared in the July, 1936, issue of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION, F. C. Finsterbach stated: "The grading of students in industrial-arts work is a matter that should be given more critical attention than practice seems to indicate. Whether we like it or not, school authorities, parents, and custom demand some sort of grading, showing the level of accomplishment in all branches of educational endeavor. That we are not called upon to justify more often the basis of our so-called marks is due either to a beneficent Providence or the usual complacency of the American public."

To reaffirm Mr. Finsterbach's statement: Grading of students in industrial-arts work is a matter that should be given more critical attention. Teachers frequently let their routine teaching duties displace the prime function of education — the inducement of personal growth in the individual. While the designing of new projects, the listing of technical terms and skills, the installation of new equipment, the planning of demonstrations, and countless other duties are important, nevertheless, so much emphasis should not be placed on this phase of the work that it excludes the discovering and recording of the progress made by those who are entrusted to the care and guidance of the teacher.

The following forms are used in the Flint industrial-arts classes, and one form is used by Mr. Byrn of the University High School, Ann Arbor.

Form I is used in auto-shop and general-shop classes. It seems to fit the needs of these two classes well. It is handled en-

JOB RECORD SHEET--AUTO SHOP
JUNIOR HIGH SCHOOL, FLINT, MICHIGAN

Grade _____ Course No. _____

Student's Name _____

Note: A student should rate himself on the following items: Neatness, accuracy, time spent, ability to follow directions, cooperation with other students and teacher; and is job mechanically perfect when finished?

Job No.	Name of Job	Date Started	Supt. O.K.	Foreman O.K.	Date Finished	Pupil Grade	Foreman Grade	Teacher Grade	Remarks

Form I

BLUEPRINT READING
DRAWING RECORD

Student's Name _____ Hour _____

Note: A student should rate himself on the following items: Neatness, accuracy, time spent, ability to follow directions, cooperation with other students and teacher; and is job mechanically perfect when finished?

	My Grade	Tchrs Grade
UNIT ONE		
1A Block		
2A End lap joint		
3A Notched block		
4A Tenon		
5A Mortise		
6A Steps		
7A Gained block		
8A Block with lug		
UNIT TWO		
9B End lap piece		
10B Guide block		
11B Oilstone holder		
12B Clamp strap		
13B T-slot block		
14B Cross-lap joint		
15B Clamping plate		
UNIT THREE		
16C Paperweight		
17C V block		
18C T block		
19C Door stop		
20C Angle		
21C Tent stake		
22C Shelf support		
UNIT FOUR		
23D Ribbed block		
24D Chiseling block		
25D Bench hook		
26D Tool bracket		
27D Vise jaw		
28D Clamp plate		

	My Grade	Tchrs Grade
UNIT FOUR (Cont.)		
29D Nail box		
30D Book end		
31D Bench stop		
32D Tool post rest		
UNIT FIVE		
33E Angles		
34E Support block		
35E Dovetail		
36E Lathe rest slide		
37E Brace		
38E Book rack		
UNIT SIX		
39F Circles		
40F Hollow cylinder		
41F Bushing		
42F Core print		
43F Bull pinion blank		
44F Funnel		
UNIT SEVEN		
45G Tangents		
46G Standard		
47G Spacer		
48G Rocker arm		
49G Cast-iron knee		
50G Bearing		

Form II

Class _____
Student's Name _____ Homeroom _____
Section No. _____ Class hour _____

Grades	1	2	3	4	Exam.	Final

	WOODWORK	Date Begun	Gr.	Fee	AUTO MECHANICS	Date Begun	Gr.	Fee
1.								
2.								
3.								
9.								
10.								

	ELECTRICAL	Date Begun	Gr.	Fee	GENERAL METAL	Date Begun	Gr.	Fee
1.								
2.								
3.								
9.								
10.								

	SHEET METAL	Date Begun	Gr.	Fee	SPECIAL	Date Begun	Gr.	Fee
1.					1. Supt.			
2.					2. Foreman			
3.					3. Stock clerk			
4.					4. Safety Fman.			
5.					5. Sweeper			
9.								
10.								

Form III

NAME _____ YEAR BORN _____

FATHERS NAME _____ OCCUPATION _____	PERSONAL & CITIZENSHIP		NOW SUMMERS ARE SPENT
ADDRESS _____ TEL. _____	I. Q. _____ AT AGE _____		19_____
" _____ " _____	BEST MARKS IN _____		19_____
NO. BROTHERS _____ NO. SISTERS _____	HOBBIES 1. _____	3. _____	19_____
DATE ENTERED _____ FROM _____ SCHOOL	2. _____		19_____
GRADE " 7-8-9-10-11-12 YEARS OF SHOPWORK _____	COOPERATION	HIGH MED. LOW	19_____
	THOUGHTFULLNESS		LIFE WORK—WISH TO BE
	WORKS WELL WITH OTHERS		19_____
	CONFIDENCE IN SELF		19_____
	CARE OF EQUIPMENT		19_____
	INGENUITY		19_____
	ABILITY TO PLAN		19_____
	ABILITY TO WORK PLAN		19_____

SUBJECTS	GRADE IN WHICH TAKEN	MARK	TEACHER
H.H. MECHANICS			
ART METAL			
GEN. METAL			
MACH. SHOP			
AUTOMECHANICS			
ELECTRICITY			
WOODWORK			

ELECTRICITY
PRINCIPLES LABORATORY WORK AND PROJECTS

FUNDAMENTAL PRINCIPLES—DEFINITIONS | LABORATORY WORK INVOLVING PRINCIPLES

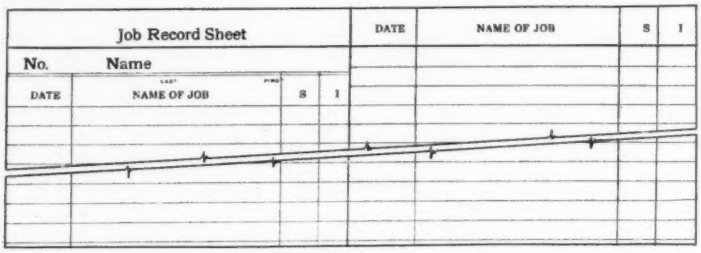
SAFETY PRECAUTIONS; USES OF ELECTRICITY; ELECTRICITY DEFINED; ELECTRICAL CIRCUITS; CONDUCTORS; INSULATORS; RESISTANCE; OHM'S LAW; CURRENT—TYPES; CURRENT—EFFECTS OF; EQUIPMENT; LAMPS; FUSES; CIRCUIT BREAKERS; PUSH BUTTONS; SWITCHES; CONNECTIONS; SERIES; PARALLEL; SERIES-PARALLEL; POWER & TRANSFORMERS; MOTORS & GENERATORS; D.C. & A.C.; CHARGING A BATTERY; TESTING A BATTERY; BELL & TELEPHONE; BELL RINGING CIRCUIT; BELL & TELEPHONE CIRCUIT; DOOR BELL & TELEPHONE CIRCUIT; BELL & TELEPHONE CIRCUIT; BELL & TELEPHONE CIRCUIT;

tirely by the student-personnel organization with the exception of the instructor's grade.

Form II is used by the junior-high-school blueprint-reading classes. The jobs listed are taken from a standardized course of study.

Form III has been worked out by two of our general-shop instructors that have particular assignment. The column marked *S* provides space for the student's grade. That marked *I* is for the instructor's grade. This form also is used by several instructors in other types of shops.

Form V was devised by Professor Marshall, University of Michigan, Ann Arbor, Mich. This form contains a complete and detailed record of the entire cess. With this in mind, and with the cooperation of the industrial-arts men in my school, an industrial personnel director, and our supervisor, this form was drawn up. Across the top are listed the qualifications that we thought are necessary to success in most any line of endeavor. These are to be graded by the instructor any time after he feels that he can do so justifiably. This record will be passed on to the next industrial-arts teacher at the end of the semester. At the end of his 8A work, this form will be given to the boy's home-room teacher, who will in turn help him choose his elective. In the Flint system, a student may choose one elective in 9B and one in 9A. With such a record to go by, a boy will not be placed in an elective auto-shop class, unless it is evident that he can do the work that is required of him. Where the classes have to



Form IV

ACCUMULATIVE RECORD FOR LONGFELLOW JUNIOR HIGH SCHOOL INDUSTRIAL-ARTS STUDENTS

Grade each qualification according to the following standards: Excellent--Good--Fair--Poor

Student's Name _____

	Quality of Work				Quantity of Work				Attendance				Safety Habits				Personal Habits				Cooperation				Interest				Attitude				Initiative			
	7B	7A	8B	8A	7B	7A	8B	8A	7B	7A	8B	8A	7B	7A	8B	8A	7B	7A	8B	8A	7B	7A	8B	8A	7B	7A	8B	8A	7B	7A	8B	8A	7B	7A	8B	8A
Blueprint Reading																																				
Woodshop																																				
General Shop																																				
Principles of Mechanics																																				
Additional Characteristics of the boy																																				

Form VI

an auto-mechanics unit in their shops, a situation that exists in only two of our junior high schools.

Form IV shows the latest developments for the auto-mechanics department. It differs from the other forms in that a boy keeps a *daily* record of the jobs that he is working on. It takes but a glance to tell the amount of time that it took to do a period spent by the boy, in industrial-arts work, both in the junior and in the senior high school.

Form VI is being used experimentally to see just what potentialities are stored up in such an approach to this problem of individual differences. As time goes on, it is recognized more and more that scholastic attainment is no guarantee for success. be limited to a certain number, it is possible to pick the best. In other words, a good student will not be turned away and a poor one left to stay. Such an accumulative record also provides for passing on to the next instructor, the good or bad special characteristics of a boy, so that the good characteristics may be encouraged and the bad ones suppressed.

Preparation of Printers' Copy

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The lack of proper preparation of printers' copy has long been a source of trouble to the printer. This is especially true of the copy prepared for the school printing department. Teachers, department heads, and even superintendents often make their alterations on the first proofs, rather than on the copy which is prepared by them or for them.

Printing, journalism, and advertising students should learn the requirements for good copy preparation. They should understand that money is saved in not having the printer reset parts of manuscripts. Printers' alterations are charged for at a considerably high rate. In schools, where printing is done practically "for nothing," as some administrators think, this is a common fault. Often alterations run as high as 60 per cent the first setting.

To combat the desire of certain authors to "write it differently," publishers are forced to include in their contracts a clause charging the alterations from original copy to the author. Usually a 10-per-cent allowance is made.

Something for all teachers to remember when they are preparing material that is to be printed.

In proofreading, galley proofs are checked for accuracy and against typographical errors. Editing is done *before* the copy reaches the hands of the printer, not after it is set in type.

The following rules of copy preparation should be learned by those who either order printing now, or will order it after school days are over.

1. Use one side of a sheet of paper. Often copy is divided into *takes* for type composition, and this eliminates any possibility of writing on both sides of the sheet. Also, the copy on the reverse side of a piece of copy is often overlooked by the machine or hand compositor.

2. Copy should be typewritten, and double-spaced. It should be an original, not a carbon copy.

3. An 8½ by 11-in. sheet should be used, with copy running the 8½-in. way of the sheet. Some shops prefer an 8½ by 5½-in. sheet, which fits well on the copyholders of the keyboard line-casting machines.

4. About 1 in. of white space should remain on the left side of the sheet, for notations or, in the case of a long manuscript, for possible punching to bind it together.

5. Copy should be flat, not rolled. Rolled copy is hard to handle.

6. Sheets may be fastened with paper clips, never sewed or stitched together. Type is usually set from one piece of copy at a time.

7. Use no pinned-on sheets, or flyers. The first must be taken off to set the copy below it; the second is too hard to handle, and cuts down production time.

8. All pages must be numbered consecutively. Inserts may be marked *4a*, for example, and inserted between pages 4 and 5.

9. Quoted matter and footnotes may be single spaced as a signal that it is to be set in a smaller type face than the text. A line should be run entirely across the page above footnotes.

10. Copy prepared by amateurs should be retyped. The copy should be carefully edited because of the following common faults:

a) Style is not always consistent.

b) Punctuation is poor or entirely missing, or it is not consistent.

c) Italics and quotes are often mixed in the matter.

d) Arabic and spelled-out figures often are present in the same manuscript.

e) Words are misspelled.

f) The copy is not broken into paragraphs.

g) The copy is too difficult to read.

11. Mark each sheet of copy *what it is*. If this is done, a stray piece of copy can be easily placed where it belongs.

12. When copy is handed to the printer, and proofs delivered, the reading should be done by a person who is competent to do the work. When one proofreads his own copy, there is a tendency to make alterations from the original. Although now and then this must be done when errors creep into the copy, alterations should be kept to a minimum.

13. If three X's are marked at the bottom of the last sheet of copy, the machine men know that this place is the end of the copy or manuscript.

A Versatile Unit for the Industrial-Arts Curriculum

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One of the major problems confronting the teacher and supervisor of industrial arts in the typical secondary school is just how to organize courses of study so that they will contribute to the needs of all students, regardless of their future plans, and be broad enough to measure up satisfactorily to the general educational objectives accepted today. Recent surveys made in Wisconsin by the Wisconsin Industrial Arts Association indicate the need for broadening the scope of industrial-arts instruction to meet the needs of the average individual of high-school age.[1] M. M. Proffitt,[2] in a recent survey conducted by the Office of Education, depicts the results of a national survey made in 20 cities having a population of 100,000 and over, which indicate emphatically the need for emphasizing the general educational values and integrating the industrial arts with the total curriculum of the school, and with general educational objectives according to grade levels. These studies, and others of a local nature, seem to be fair indication of current problems in the field, and serve as a positive means of pointing to imperative changes which must take place in order to make the industrial arts contribute vitally to the needs of present society, and to the objectives of modern education. Certainly in the past the arts have stressed the manipulative and technical aspects at the expense of the pertinent general informational values, inherent in every shop subject.

In the Wisconsin High School during the past year an experiment has been conducted with a group of 22 sophomore boys and girls to determine some types of industrial-arts instruction which can be offered to meet the needs of all high-school students in present and future life (it is assumed that there are phases which are of vital value to boys and girls in the intermediate and secondary school). The following objectives were set up for the course:

1. To develop appreciative attitudes toward industry and industrial workers.

2. To develop handy-man skills, such as are needed in everyday life about the home and office.

3. To develop consumer knowledges and appreciations for industrial products, to enable the pupil to select, use, and maintain these products wisely.

4. To give vocational guidance through the study of the various industries.

5. To develop avocational and leisure-time interests.

This course is very versatile. By some it has been described as a combination of vocational guidance, social science, and home mechanics. This contention is correct. The course is seasoned highly with guidance and is broad in its scope — legitimately so it is hoped. It is also evident that a course organized about the objectives just listed, must be taught quite differently from the traditional shop course, and that it presents some difficult instructional problems, as a great deal of the instructional materials and methods take the class away from the shop setting. However, this type of organization still provides for the *material media*, so conducive to student interest, because the student is in constant contact with the manipulative side of the unit, which is carried as a parallel to the informational aspects of the work. A brief description of the organization and methods employed with this experimental class will serve to

[1] Wisconsin Industrial Arts Curriculum Survey, 1936–37.
[2] "Trends in the Industrial Arts," *School Life*, February, 1936.

illustrate the procedure employed in attempting to arrive at the goals just listed.

Developing Appreciative Attitudes Toward Industry and Industrial Workers

One of the values of industrial arts is to assist young people to obtain firsthand experience with the realistic machines and processes of industry, along with a realization of the current problems confronting employees, employers, and society at large. In an effort to realize this objective the census is studied briefly in order to acquaint the student with the many existing types of work and workers. Small class committees then choose a particular industry or allied branch of a major industry and arrange a class excursion into a representative plant. On some occasions the class has traveled 100 miles from the city to reach a plant not represented locally. An outline of study for each trip is prepared by the committee and discussed by the class before each visit is made. Following the visit each individual writes a report on his reactions, and then the visit is discussed again by the class at its next session.

Dr. A. H. Edgerton's Ten-Year Occupational Study has been referred to consistently, and has proved to be invaluable in getting the information regarding the many trends evidenced in some 2,600 jobs. From this study the student is impressed with the vocational, educational, and personal qualifications necessary in the various vocational pursuits. In addition to the visits to industrial plants, and the study of occupational trends, an understanding of industrial operations is brought to the student through the use of visual aids. The many films now available on manufacturing processes augment the things that are read about and observed on the visit. These activities give the student pertinent information which serves as a definite means for providing vocational guidance. This type of guidance is functional to a high degree, and is interesting to the student. The writer is of the opinion that much of the occupational guidance which will be done successfully in the future will be done through the various curricular subjects. The industrial arts furnish the most logical subjects in the entire curriculum through which to administer occupational guidance and to develop appreciative attitudes toward the vocational pursuits of some 80 per cent of our national working population. Personal and social qualifications are studied as well as training requirements in an effort to give a complete picture of all of the demands in the vocations considered.

Developing Handy-Man Skills

In an effort to make the student sensitive to the many typical repair and maintenance jobs which arise about the home and office, the student is encouraged to examine for himself and to inquire of his parents into the type of jobs which commonly come up. Following this appraisal a list of these jobs is brought into the class and a committee of class members compile a cumulative list to be placed into the hands of each student. From this inclusive list each student rates the jobs as to their frequency of occurrence and their importance. Finally the student selects one or several problems or projects to be worked on in the laboratory, depending upon his needs, abilities, and the nature of the work involved. It is apparent that much student activity is secured throughout, that the students are highly motivated, that each student is confronted with problems to be solved, and that the student is called upon to plan and think critically in order to perform the one or several tasks he selects. Through the doing of each handy-man job the student gains a knowledge of the use and care of common tools, in addition to gaining much related information of a general nature, which aids him in becoming an intelligent chooser and user of industrial products.

A few of the problems observed by students are listed below to illustrate the type of jobs selected by the group. This sampling, it will be noted, represents activity in several industrial-arts fields, and gives the group a reasonably representative picture of a good share of the common problems occurring in connection with the use of industrial products, as well as indicating the skills essential in maintaining these products.

Types of Jobs

1. The piece of furniture which needs refinishing.
2. The faucet which clatters and vibrates when water is turned on.
3. The faucet which drips continuously.
4. The chair which has loose rungs and wobbles.
5. The window which binds and will not open freely.
6. The electric-light socket which sparks when plugging it in.
7. The electric lamp which flickers when walking near it.
8. The water which stands in the sink or runs down into the drain too slowly.
9. The lavatory flush bowl which leaks and permits the continuous run of water.
10. The lock on the door which will not fasten when key is turned.
11. The furnace or fireplace which smokes and does not get the proper "draw."
12. The casters on dresser or buffet which slide along the floor.
13. The knife or scissors which is dull.
14. The radio connection which is loose and needs soldering.
15. The vacuum sweeper which does not pick up dirt well from the floor, and the motor which sparks when running.

This sampling of problems arising about the home can be augmented at length, and other typical problems pertaining to the automobile and leisure-time activities may be added. The interesting angle is that the student brings in these problems, and sees a real need for their solution. Of course, a thorough familiarity with common tools and their use is obtained in the doing of these jobs.

As these little projects are worked out, various members of the class, and the instructor, bring in discussions on the buying and maintaining of industrial products. Students work up and present to the class the results of research made on such topics as: "The modern heating unit," "how plumbing has changed," "mechanical refrigeration," "types and appropriate designs of furniture and furnishings for the home," "paints, varnishes and their use," and other selected topics paralleling the laboratory work. Written reports on these topics are filed in the shop library for future reference.

Developing Consumer Knowledges and Appreciations

The vast increase in varieties of industrial products on the market makes it imperative that intelligent discrimination be exercised by the consumer in the selection and use of these products. The Wisconsin State Department of Agriculture and Markets has co-operated in making available much worth-while information on consumer problems. Trips are made to the state officers to study this phase of the course, and the individual students work up displays of cans and bottles illustrating the many ways in which the consumer may be fooled in buying canned articles in containers which look large but contain little. Such topics as: "Quantity discrepancies," "adulteration," "misrepresentation," "price mark-ups," "high-powered and bogus advertising," "ingenuity in substituting equally good products for the expensive," and the like, are discussed by the group. The following references were found especially useful in this study: The Wisconsin State Department of Agriculture and Markets, *Consumer Digest, Consumer News, Consumer Research, Consumer Education,* pamphlets published by the Household Finance Corporation on: Gasoline, oil, and tires, kitchen utensils, floor coverings, and pamphlets published by General Motors Corporation.

This consumer unit was received enthusiastically by the group, and it is felt that such information is an essential part of every individual's education today. The industrial arts are again the logical subjects for disseminating such information.

Developing Leisure-Time Interests

The ever-increasing problem confronting youth and adults today seems to be, "What shall I do when I have nothing to do?" Probably what the individual does during his leisure time has a very definite bearing upon his success while working. Leisure time is increasing. Employers are realizing this problem and are becoming more and more concerned with what their employees are doing in their spare time, and education, too, is realizing its responsibility in developing avocational interests to meet the needs of a population working 5, 6, and 7 hours per day, in contrast to the 8-, 10-, and 12-hour day of but a few years past. Many types of leisure activity cost the individual excessive money.

Never has so much money been spent nationally on such things as baseball, fights, movies, etc. These activities are fine for those who can afford and enjoy them. Thousands of others are seeking diversion in other forms of activities which are of a different nature, such as the home workshop. Manufacturers of home-workshop equipment report substantial gains in sales during recent months. In this course an attempt is made to familiarize the student with the many constructive things which can be done in the home workshop, and the satisfaction that can be derived from the planning and making of projects needed about the home. Several students have small workshops at present. Some are saving to secure equipment for the home shop. Opportunity for work outside of the regular class period is made available for those who wish to use the school shops to develop projects. As the student gets an understanding of the way tools and machines are used, and of the projects which can be constructed, it is hoped a desire will be instilled to use at least a portion of his leisure time for some constructive homework.

The Shop Setting

Two adjoining shops were used by this class: one a general woods shop and the other a general metals shop. It should be mentioned that a minimum amount of machines and power equipment is adequate for conducting a class of this type, as a knowledge of common tools for developing handy-man skills, attitudes toward industry, and information on industrial products, are paramount objectives. Approximately one half of the course, which runs one semester, is devoted to planning and manipulative work with tools, and the remaining time is spent on the related aspects of the course described before in this report. Contrary to original assumptions little difficulty was experienced with keeping interest at a high point throughout the unit, despite the fact that considerable more than the usual amount of time was spent on other activities than "actual doing with the hands." It is believed that the diversified nature of the work, coupled with the provision for much student participation in topics, research, and planning, made for this desirable situation. The instructor made a definite effort to keep in the background, acting as a guide rather than a dictator, and the students apparently assumed well the responsibility placed on them.

Taken in total, a course of this type apparently meets the needs of a great majority of boys and girls, regardless of their future plans. It provides rich opportunity for integrating the industrial arts with other subjects in the curriculum and is a definite departure from the traditionally specialized shop course which has been receiving criticism from educators who insist that the industrial-arts curriculum has been too much a "field unto itself, and too little a contributing factor to general educational objectives." Much remains to be done in making the industrial arts more versatile in meeting the needs of the average high-school student; in acquainting these young people with the most dominant element in their environment — industry, its products, materials, and problems. Possibly schemes like the course described herein may be the means of securing a partial solution to the problem of how best to motivate the industrial-arts subjects!

Why a School Newspaper?

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High School,
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How one school printing instructor answers the question. His answer as it is, or augmented by additional arguments, may serve other printing instructors as well.

Every once in a while, someone not familiar with all the phases of a school newspaper will ask "What good is a school newspaper?" Sponsors or advisers for school newspapers and printing instructors are often called upon to answer this question. It can be answered in many ways, but offhand, most industrial-arts teachers probably would consider the question from the mechanical side rather than from the broader viewpoint. To give a satisfactory answer to the question requires that all the points in defense of the school newspaper should be brought out.

It might be well to preface the answer to the foregoing question by asking another question: "What good is the daily newspaper, the radio, or the movies?" Obviously, any medium that serves to broaden the experiences of the student has a place in the educational system. Viewed from this angle, the school newspaper is one of the most successful and most effective educational activities carried on in the school.

The value of a school newspaper can be considered from three angles — that of the staff members, that of the faculty and student body, and that of the parents and the community.

The most direct value is probably that which is received by the members of the staff. The variety of experiences gained by the pupils who work on a school newspaper can hardly be gained in any other way. Pupils, through their work on a school paper, develop their power of observation, which is considered by many to be the principal method of learning. School journalists soon learn the necessity for the use of correct English. The value of time is brought more forcibly to the attention of a boy or girl who works on a school paper and has a "deadline" to meet. The school journalist is impressed with the fact that his class assignments as well as his newspaper assignments must be in on time. Pupils who serve as reporters develop ability and confidence when they meet and talk with people in their task of gathering news. The relationship between the editorial and mechanical parts

of the school newspaper brings about the quality of co-operation, which is an important factor in our everyday life.

Those who reach an executive position on a school paper develop leadership, and learn how to work with and direct the activities of others. Members of the business staff of a paper gain practical experience with businessmen and business methods which will be a decided advantage to them when they finish school. Of course we should not get the mistaken idea that everyone who works on a school paper is going to take up journalism as a vocation. This is no more true than is the old idea that every boy who took up woodworking in school was going to be a carpenter or a cabinetmaker. It would be impossible to place everyone with a newspaper after graduation. Even if it were possible, one would not want this to happen because school journalism, although resembling professional journalism in many respects, is still quite different. However, the experiences, gained as a staff member of a school newspaper, will give the boy or girl a better appreciation of what a newspaper is, and its value to the people.

In considering the value of a school newspaper to the pupils and faculty members, it is necessary only to examine the purpose or policy of any school paper. The primary purpose of the school newspaper is, or should be, the presentation of all the news pertaining or relating to the school, either directly or indirectly. The school paper should serve the interests of students and faculty. It can do much toward helping to improve the school in many little ways that individuals alone would be unable to do. A school paper can back many projects that will make for better school life.

Pupils who read their school newspaper will become more intelligent readers, both in their classwork and at home. They read about happenings with which they themselves are familiar, and thus they are more likely to give thought to that which they read. This tends to help them develop an open mind with the ability to analyze what they read, and weigh its relative merits. It seems that the school paper can bring out these qualities in an individual more readily than work in the classroom.

The value of a school newspaper does not stop with the school itself. The paper is also of great value to the parents and to the community. Nearly every copy of a school newspaper that is distributed in school is read by at least one other person in the community who is not a pupil. In this way, the paper serves to bring the parent and the school closer together. Parents read of the activities of the school and learn more of their children's school life than is possible without the school paper. It is a link between the home and the school that may be stronger than all others.

The school newspaper possesses interest even for those who have no children in school. Such a person reads the paper to acquaint himself with what the school is doing, what his neighbor's children are doing, to find out where the taxes go, or how present-day education compares with the education of his own boyhood days. All these and many more things are presented to the people of a community through the columns of the school newspaper.

The value of a school newspaper is held by some to be greater than that of sports, debating, dramatics, or some of the other work now carried on as extracurricular activities. Certainly the school that hasn't a newspaper is losing a valuable opportunity to enlarge its educational services, not only to the children in the school, but to the community as well. The printing instructor is in the key position when it comes to starting a school newspaper, and he should make use of all of the foregoing arguments to convince the members of his school that they need a school newspaper.

Predicting Trade-School Success—III

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The third part of this study covers the relations of entering age and intelligence, to achievement in shopwork.

Relation of Entering Age to Achievement in Shopwork

The relation of entering age to the shop teachers' marks is shown in two ways: (*a*) For each of the seventeen different trades and (*b*) for the five combined trade groups; namely, the building trades, the electrical, the graphic arts, the metal, and the woodworking trades.

TABLE X

RELATION OF ENTERING AGE TO SHOP TEACHERS' MARKS FOR COMBINED TRADE GROUPS

Trade Groups		*Entering Age* 14	15	16	17	18	19	20&21	*Total*
Building	N	78	105	44	22	8	3		260
	A	1.92	1.86	2.15	2.47	2.56	3.00	.....	
Elect.	N	75	124	89	36	24	10	10	368
	A	2.04	2.18	2.36	2.12	1.95	2.22	3.47	
Metal	N	93	154	78	48	26	14	8	421
	A	2.37	1.92	2.46	2.34	2.37	2.57	2.96	
Woodwork	N	82	99	61	17	5	4	3	271
	A	2.21	1.99	2.11	2.86	2.15	2.25	2.50	
Graphic Arts	N	67	82	54	34	16	6	5	264
	A	2.10	2.18	2.08	1.86	2.54	2.20	1.85	

N—Number of Boys A—Average of Shop Teachers' Marks

The data were treated statistically[19] using the standard formulas for the mean, standard deviation, probable error of the mean, the probable error of the difference of the means, and the critical ratio.

Table IX shows the averages of the teachers' marks in shopwork in each of the seventeen trades and for each entering age at one-year-step intervals. These averages show that in certain departments the younger boys do better work; in others, the older boys. The majority of these averages show that the boy entering at 16 years of age seems to do best. The numbers, in certain trades, taper off rapidly for the entering upper age levels and become less reliable. To obtain larger numbers for the various age levels and to make more adequate comparisons the trades were grouped into five trade groups.

Table X shows these averages for the trades when combined. In this table we find the following: In the building trades, the best work is done by the boys entering at older ages; in the electrical trades, the 16-year-olds seem to do best; in the

[19] Holzinger, Karl J., *Statistical Methods for Students in Education*, Ginn & Company, 1928.

TABLE IX

TABLE IX

RELATION OF ENTERING AGE TO SHOP TEACHERS' MARKS FOR EACH TRADE

Shops		*Entering Age* 14	15	16	17	18	19	20&21
Auto	N	34	90	37	22	7	5	4
	A	2.47	2.00	2.68	2.38	2.03	2.10	2.81
Bricklaying	N	16	30	6	4		2	
	A	2.32	2.22	3.00	3.00	.....	3.00	.....
Cabinet	N	48	62	33	12	4	1	1
	A	2.16	2.22	2.46	3.06	2.43	3.00	2.00
Carpentry	N	19	23	12	4		1	
	A	2.64	1.70	2.56	2.25	.....	3.00	.....
Commercial Art	N	15	13	13	9	5	1	2
	A	1.83	1.88	1.48	1.88	2.35	1.00	1.00
Elect. Wiring	N	45	58	38	13	2	5	2
	A	1.89	2.03	2.23	2.03	3.00	2.10	3.75
Elect. Power	N	16	36	21	17	15	2	2
	A	1.78	2.15	1.96	1.85	1.41	2.87	3.75
Foundry	N	21	24	15	7	3		
	A	1.95	1.66	1.96	1.75	1.66	.....	.....
Machine	N	22	36	11	10	4	2	2
	A	2.39	1.81	2.11	2.32	1.50	2.12	3.25
Pattern	N	15	14	10	1	1	2	1
	A	1.85	1.46	1.70	3.00	1.00	3.00	2.00
Plumbing	N	13	20	7	3	6		
	A	0.75	1.75	1.55	1.75	2.25	.....	.....
Printing	N	35	41	25	13	5	3	1
	A	2.39	2.12	2.36	1.79	2.30	2.66	2.00
Radio	N	11	18	22	2	3	2	2
	A	2.72	2.56	2.89	3.25	1.91	2.00	3.62
Sheet Metal	N	30	32	19	11	2		
	A	1.75	1.72	2.13	2.56	3.50	.....	.....
Telephone	N	4	12	8	4	4	1	2
	A	2.81	2.39	2.59	3.00	3.50	2.00	2.75
Trade Draft	N	17	28	16	12	6	2	2
	A	1.76	2.42	2.14	1.93	2.91	2.63	2.62
Welding	N	16	4	15	9	12	7	2
	A	2.65	2.56	2.65	2.75	3.02	3.03	3.00
Totals	N	377	541	308	153	79	36	26
Aver.	A	2.13	2.12	2.28	2.32	2.27	2.48	2.79

N—Number of Boys A—Average of Shop Teachers' Marks

TABLE XI

RELIABILITY OF THE MEANS OF SHOP TEACHERS' MARKS FOR EACH ENTERING AGE FOR EACH ADVANCING YEAR

Classification	*Number*	*Mean*	*Standard Deviation*	*P.E. Mean*
14	377	2.130	.888	.030
15	541	2.121	.934	.027
16	308	2.287	.907	.034
17	153	2.327	.978	.053
18	79	2.275	1.071	.081
19	36	2.487	.966	.108
20-21	26	2.798	.912	.121

TABLE XII

RELIABILITY OF THE DIFFERENCES OF THE MEANS OF SHOP TEACHERS' MARKS FOR EACH ENTERING AGE

Entering Age	*Ages at one year intervals* 14	15	16	17	18	19
14	.....	.....	.....	.....	.....	.....
15	.22	.....	.....	.....	.....	.....
16	3.5	3.8	.....	.....	.....	.....
17	3.2	3.4	.63	.....	.....	.....
18	1.6	1.8	.20	.54	.....	.....
19	3.2	3.2	1.82	1.33	1.57	.....
20-21	*5.3	*5.5	*4.09	3.56	3.61	1.92

Critical Ratio = Obtained Mean Difference / P.E. of Mean Difference and is reliable when ratio is 4.00 or above.

*A reliable difference.

TABLE XIII

MEANS OF SHOP TEACHERS' MARKS FOR EACH ENTERING AGE

Classification	*Ages at two year intervals* Number	Mean	*Standard Deviation*	*P.E. Mean*
14 and 15	918	2.125	.915	.020
16 and 17	461	2.295	.935	.029
18 and 19	115	2.305	1.030	.065
20 and 21	26	2.742	.940	124

TABLE XIV

RELIABILITY OF THE DIFFERENCES OF THE MEANS OF SHOP TEACHERS' MARKS FOR EACH ENTERING AGE

Entering Age	*Ages at two year intervals* 14-15	16-17	18-19	20-21
14-15	.....	.....	.....	.....
16-17	*4.8	.....	.....	.....
18-19	2.6	0.14	.....	.....
20-21	*4.9	3.5	2.6	.....

*A reliable difference

TABLE XVII

RELIABILITY OF THE MEANS OF SHOP TEACHERS' MARKS FOR EACH ENTERING ONE-HALF YEAR GRADE

Classification	*Number*	*Mean*	*Standard Deviation*	*P.E. Mean*
9B	864	2.081	.937	.021
9A	130	2.202	.883	052
10B	271	2.325	.882	.036
10A	85	2.335	1.046	.076
11B	81	2.385	.870	.085
11A	19	2.565	.672	.104
12B-A	24	2.468	.730	.101
P.G.	46	2.832	1 030	.102

metal trades, the 16-year-olds seem to do best, although the 19- and 20-year-olds are somewhat higher. The number of boys in these latter age groups is comparatively small. In woodworking, 17 years of age seems best, and in the graphic arts, 15 years of age seems best.

Table XI shows the relation of entering age to shop teachers' marks for the combined trades. The entering ages are given in one-year-step intervals, with their corresponding number of boys, the means of the shop teachers' marks, the standard deviations, and the probable errors of the means. The differences in the means of the shop teachers' marks are small. They increase somewhat for boys entering at 16 and 17 years of age; drop a little at 18; and increase for boys entering at 19 to 21. These differences, however, are not all reliable as shown in Table XII.

Table XII shows the difference in the means of the shop teachers' marks to be reliable for the 20–21-year-old group of boys. As the means of the shop teachers' marks are higher for this age than at other entering ages, and as the difference in the means is a reliable difference for ages 14, 15, and 16, then boys entering at this age will earn higher teachers' marks than at ages 14, 15, and 16. This entering age, however, is too near the age limit set by the School Law of Pennsylvania,[20] and is, therefore, not the best age for boys to enter the trade school.

As the critical ratio for the 16-year-olds and 17-year-olds is near 4.00, and the means of the shop teachers' marks are higher for these ages than for the 14- or 15-year-olds, and as these ages provide four years of training before the compulsory legal age for leaving, these entering ages seem to be the best for entering the trade school.

Ages taken at one-year intervals failed to give reliable differences in the means of shop teachers' marks, with the exception of the 20–21-year-old group. To determine whether or not the one-year interval was too small for obtaining reliable differences in the means, the ages were combined into two-year intervals.

Table XIII shows the groups combined taking the 14–15-year-olds as one group, 16–17-year-olds as a second group, the 18–19-year-olds as a third group, etc., with their corresponding number of cases, means, standard deviations, and probable error of the means.

Grouped in this way the means of the shop teachers' marks increase for each entering age group, implying that as the boy's age increases, his chances increase for earning higher shop teachers' marks.

This is in agreement with the findings of the Minnesota Study.[21] Table XIV, however, shows these differences in the means are not all reliable. Reliable differences were found for only two age groups: the 16–17-year-olds and the 20–21-year-olds. The 16–17-year-olds are, according to these findings the best prospects, other things being equal, as the 20–21-year-olds are too near the legal age limit set by the School Law[22] as previously noted.

[20]The School Law, Pennsylvania, Section 1401, 1929.
[21]Minnesota Mechanical Ability Tests, *op. cit.*

Relation of Entering Grade to Achievement in Shopwork

Grade, like age, as an entrance requirement to trade school varies considerably throughout Pennsylvania.

[22]School Law, Pennsylvania, *op. cit.*

The Smith-Hughes Act[23] mentions no specific grade as an entrance requirement. Anyone who can profit by the training offered is entitled to training under this act.

Like entering age, entering grade has been advanced, due largely to the fact that employment opportunities are not available for the younger boy with the result that boys are staying in school longer. Where the trade-training facilities are limited, the entrance requirements have been raised giving the upper-grade boys the preference.

The same group used as a study group

[23]Smith-Hughes Act, *op. cit.*

TABLE XV

RELATION OF ENTERING GRADE TO SHOP TEACHERS' MARKS FOR EACH TRADE

Shop		*9B*	*9A*	*10B*	*10A*	*11B*	*11A*	*12B&A*	*PG*
Auto	N	87	22	55	10	15	3	4	3
	A	2.44	2.39	2.44	3.05	2.78	3.00	2.00	3.16
Bricklaying	N	42	5	6	1			2	
	A	2.30	2.10	2.79	2.00	.....	.....	4.00	.....
Cabinet	N	129	8	14	3	3			4
	A	2.14	2.56	2.89	2.00	2.66	.....	.....	3.25
Carpentry	N	40	8	7	1	1		1	1
	A	2.31	2.25	2.25	3.25	4.00	.....	3.00	3.00
Commercial Art	N	25	5	6	7	9	1	2	3
	A	1.74	1.60	2.00	1.92	1.11	2.25	2.50	2.16
Electric Wiring	N	113	21	20	3	3	1		2
	A	2.07	1.48	2.52	1.17	2.50	2.00	.....	3.25
Electric Power	N	42	11	23	13	7	3	3	8
	A	2.04	2.13	1.81	2.25	2.46	2.50	2.66	2.00
Foundry	N	49	5	12	4	1			
	A	1.60	1.80	2.20	1.75	1.00	.....	.....	2.06
Machine	N	47	8	18	2	3		6	3
	A	2.13	2.53	1.61	1.62	2.16	.....	2.25	3.16
Pattern	N	32	2	8	2	1			
	A	1.90	1.50	1.53	1.00	1.00	.....	.....	.....
Plumbing	N	32	5	8		1	2		1
	A	1.32	1.25	1.37	.....	2.00	2.62	.....	3.50
Printing	N	58	10	31	5	10	4	2	3
	A	1.81	2.50	2.54	2.20	2.37	2.25	2.87	2.06
Radio	N	16	6	17	13	4	2		3
	A	2.81	2.70	2.32	2.67	2.62	3.75	.....	2.08
Sheet Metal	N	80	3	4	7				
	A	1.48	2.33	3.31	2.46	.....	.....	.....	.....
Telephone	N	9	1	13	6	4			2
	A	2.58	3.00	2.57	2.58	2.75	.....	.....	4.00
Trade Draft	N	44	7	17	2	9		1	3
	A	1.84	2.81	2.23	1.25	2.77	.....	3.00	3.25
Welding	N	19	3	12	6	9	3	3	10
	A	2.85	3.08	3.00	2.25	2.27	2.16	2.63	3.22
Summary	N	864	130	271	85	81	19	24	46
	A	2.08	2.20	2.32	2.33	2.38	2.65	2.46	2.83

N—Number of Boys A—Averages of Shop Teachers' Marks

TABLE XVI

RELATION OF ENTERING GRADE TO SHOP TEACHERS' MARKS FOR THE COMBINED TRADE GROUPS

		Entering Grades							
Trade Groups		*9B*	*9A*	*10B*	*10A*	*11B*	*11A*	*12B&A*	*PG*
Building	N	194	21	25	9	2	2	3	2
	A	1.80	1.98	2.27	2.50	3.00	2.62	2.33	3.25
Electric	N	180	39	73	35	18	6	3	15
	A	2.15	1.89	2.26	2.32	2.57	2.83	2.66	2.41
Metal	N	202	38	97	22	28	6	10	16
	A	2.20	2.40	2.32	2.39	2.45	2.58	2.19	3.20
Woodwork	N	201	18	29	6	5		1	5
	A	2.13	2.30	2.36	1.87	2.60	.....	3.00	3.20
Graphic Arts	N	127	22	54	14	28	5	2	9
	A	1.81	2.39	2.38	1.50	1.60	1.25	2.00	2.19

N—Number of Boys A—Average of Shop Teachers' Marks

for the relation of entering age was used for studying the relation of entering grade to shop teachers' marks. This group has a range of entering grades from the 9B through the 12A and postgraduates.

Table XV shows the averages of the teachers' marks in each of the seventeen trades and for each entering grade at one-half-year intervals starting with the 9B grade. These averages show that in certain shops the boys from the lower grades do better work; in other shops, boys from the upper grades excel in shopwork. The number of boys in the upper grades drop off rapidly and become less reliable.

To obtain larger numbers for the various grade levels the trades were combined into five trade groups. This grouping follows the same plan as used for the entering-age study.

Table XVI shows these averages for the trades combined.

Table XVIII shows the difference in the means of the shop teachers' marks to be reliable for the 10B and P.G. group of boys. The mean of the shop teachers' marks for the 10B group is higher than the 9B and 9A; the difference in the means is reliable. The mean for the P.G. group is higher than any of the lower grades; the difference in the means is reliable for all grades below the 11B. The P.G. group, according to these findings, are the best prospects for trade work with the 10B's coming in next. The 10B's have some advantage over the P.G. group for those trades requiring a longer period of training. The P.G.'s if of normal school age, are between 18 and 19, and, therefore, have less time to spend in school.

For further comparisons of relationships, the grades were combined into one-year intervals, taking the 9B and 9A as one group, the 10B and 10A as another, 11B and 11A as another, etc. These relationships are shown in Table XIX.

TABLE XVIII

RELIABILITY OF THE DIFFERENCE OF MEANS OF SHOP TEACHERS' MARKS FOR EACH ENTERING HALF-YEAR GRADE

Entering Grade	*9B*	*9A*	*10B*	*10A*	*11B*	*11A*	*12B&A*	*P.G.*
9B	.....	.....	.....	.....	.....	.....	.....	.....
9A	2.1	.....	.....	.....	.....	.....	.....	.....
10B	5.8*	1.9	.....	.....	.....	.....	.....	.....
10A	1.6	0.6	0.26	.....	.....	.....	.....	.....
11B	3.4	1.7	0.59	0.50	.....	.....	.....	.....
11A	3.6	3.2	2.2	2.3	1.4	.....	.....	.....
12B&A	3.7	2.3	1.3	2.3	0.6	2.1	.....	.....
P.G.	7.2*	5.5*	4.7*	4.8*	3.4	1.8	2.5	.....

*A reliable difference

TABLE XIX

RELIABILITY OF THE MEANS OF SHOP TEACHERS' MARKS FOR EACH ENTERING YEARLY GRADE

Classification	*Number*	*Mean*	*Standard Deviation*	*P.E. Mean*
9th year	994	2.097	.955	.020
10th year	356	2.327	.922	.032
11th year	97	2.420	.837	.057
12th year	24	2.468	.730	.101
P.G.	46	2.832	.103	.102

TABLE XX

RELIABILITY OF THE DIFFERENCES OF MEANS OF SHOP TEACHERS' MARKS FOR EACH ENTERING YEARLY GRADE

Entering Grade	*9th*	*10th*	*12th*	*12th*	*P.G.*
9th year	.....	.....	.....	.....	.....
10th year	6.06*	.....	.....	.....	.....
11th year	5.33*	1.43	.....	.....	.....
12th year	3.60	1.06	.41	.....	.....
P.G.	7.06*	4.71*	3.50	2.54	.....

*A reliable difference.

TABLE XXI

CORRELATION OF I.Q. RATINGS WITH SHOP TEACHERS' MARKS AT END OF FIRST AND THIRD SEMESTERS

Semester	*r*	*P.E.*	*N*
At end of first semester	+.127	.024	737
At end of third semester	+.231	.035	322

The Relation of Intelligence (I.Q. Records) to Achievement in Shopwork

The I.Q. records were obtained from two sources: records from the school formerly attended and records from the trade school. The majority of the records came from the trade school where the vocational counselor administers all tests. The high schools and trade schools use the Otis Self-Administering Intelligence Tests. The majority of the I.Q. records are, therefore, based on the same test which makes for uniformity in the I.Q. records.

The shop teachers' marks are the same as used in other parts of this study and need no further explanation.

Correlations

The I.Q's ranged from 50 to 130; the shop teachers' marks, from 0 to 4.00. The Pearson Product moment formula was used in finding the correlation coefficients. Two correlations were computed to determine the consistency of relationship between the I.Q. records and teachers' marks in shopwork. One correlation was made at the end of the first semester, the other at the end of the third semester. The third semester was chosen because this provided one and one-half years of shopwork, permitting the boys who were not in the shop of their first choice during the first semester, to be properly placed and to give the instructor ample time to give an estimate of their true ability.

These correlations are shown in Table XXI.

As shown in this table, the correlations are low, are positive, and are reliable. They indicate that there is some relationship, not very high, but of sufficient size to warrant further investigation.

The average I.Q's for these five groups range from a low of 91.48 in the building-trades group to a high of 95.75 in the electrical group. The differences between these average I.Q's are not sufficient to state that one group of trades requires a marked difference in the intelligence requirements.

Table XXII shows that the chances for the below-normal group to make A's and B's in shopwork decreases with length of time in shopwork, and that the chances for the above-normal group increase as they remain longer in shopwork. The data are shown at the end of the first, third, and fifth semesters. The numbers become too few to extend the study beyond the fifth semester. This table is read as so many chances in 100 of making a grade in shopwork with an I.Q. below normal, normal, or above normal.

Summary of Findings of Relation of Entering Age, Entering Grade and Intelligence to Shop Teachers' Marks

1. *Relation of Entering Age to Shop Teachers' Marks.* Boys entering the trade school at 16 and 17 years of age are the best prospects when shop teachers' marks are used as criteria of trade-school success. This, however, varies somewhat with the different trades.

2. *Relation of Entering Grade to Shop Teachers' Marks.* Boys entering at the tenth grade are the best prospects when shop teachers' marks are used as a criterion of trade-school success. This may vary somewhat with the different trades.

3. *Relation of Intelligence to Shop Teachers' Marks.* Boys with better than normal intelligence have better chances for making higher marks in shopwork than boys with below-normal intelligence.

The chances for boys with above-normal intelligence to make an A or B in shopwork increase with length of time in shopwork, whereas the chances of those boys with below-normal intelligence decrease with length of time in shopwork.

(To be continued)

TABLE XXII

CHANCES FOR PLACEMENT (COMBINED TRADES) IN THE A-B-C-D-E LEVEL OF TRADE SCHOOL SHOP WORK AT THE END OF THE FIRST, THIRD, AND FIFTH SEMESTERS WHO HAVE AN INTELLIGENCE RATING OF: BELOW NORMAL, NORMAL, OR ABOVE NORMAL

Classification Shop Teachers' Marks	Below Normal (50-89) %	N	Normal (90-109) %	N	Above Normal (110-138) %	N	Total
(A and B)[1]	17.6	34	22.1	95	36.5	42	171
(A and B)[3]	13.1	10	32.3	63	38.0	20	93
(A and B)[5]	12.5	2	35.1	26	45.4	15	43
C[1]	49.7	96	45.9	197	44.3	51	344
C[3]	59.2	45	51.7	101	46.1	24	170
C[5]	68.7	11	52.7	39	48.4	16	66
(D and E)[1]	32.6	63	31.9	137	19.1	22	222
(D and E)[3]	27.6	21	15.9	31	15.3	8	60
(D and E)[5]	18.7	3	12.1	9	6.1	2	14
Total 1		193		429		115	737
Total 3		76		195		52	323
Total 5		16		74		33	123

Note: The subscripts 1, 3, and 5, after the shop teachers' marks refer to marks given at the end of the first, third, and fifth semester.

Study of Traffic Safety—I

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This study was conducted specially to determine the opportunities offered to teachers who want to prepare themselves for teaching traffic-safety courses.

To make a complete study of traffic and highway safety, one should incorporate a study of the development of the automobile. Such a study would start with the beginning of the automobile in this country at the turn of the century, and with the opposition which it experienced at first, not only from outside sources — for the tradition of the horse was hard to overthrow — but also from within the ranks of the industry itself. For years, engineers could not decide which type of automobile engine should be developed; the steam, the electric, or the gasoline. Uncertainties and failures in the early days of the automobile were many, widespread, and drastic as is evidenced by the scores of automobile names once familiar, that are no longer known.

After the automobile had established itself, however, evolutionary changes were fast and extreme. Styles of the modern motor car are not only revolutionary, in respect to those of a few years back, but are constantly undergoing marked changes on a yearly basis. The speed of the car has been increased to the point where it is believed by some to have exceeded its safety factor. The number of cars in service has multiplied in such proportions and with such rapidity that conditions for the safe operation of these vehicles have not been able to keep pace.

In less than forty years this phenomenon, with its Frankenstein aspects, has developed so fast, and the social aspects have lagged so dangerously far behind, that today we are faced with the problem of wholesale slaughter while we grope about, in semidarkness, for the cure.

All these aspects which lie back of, and are directly tied up with a study of traffic safety, deserve more attention than this article can give to them. For apparent reasons, the foregoing brief mention will have to suffice.

In the field of general safety, a study of the period prior to 1912 shows that some effort was made to reduce the number of accidents and also to bring the need of such efforts to the attention of the general public. People took accidents for granted and believed that since people always had been maimed and killed in industry, the two necessarily went hand-in-hand, and that little could be done about it.

About the year 1912, industry was aroused to the fact that accidents were not essential to human progress and that business could be run more efficiently and profitably if the number of accidents were reduced. This may have been prompted by Federal Compensation Laws passed in 1907 and 1908.

R. H. Gocker helps to explain the working out of this theory. He says,[1] "A few years ago when the accident rate in industry became appalling, it was found that safety campaigns were successful only when entered into by both employer and employee. Safety lectures and advice to employees were practically useless until they could see that the employer had done all he could to make the machinery and working conditions conducive to practising safety habits. In other words, the campaign was a co-operative affair. Another parallel that might be drawn from the industrial campaign seems to indicate that the physical aspects should precede the mental. It seems that the attitude of the worker toward safety became a wholesome one only after the shop environment was as near accident proof as possible."

Traffic Safety

Centering our attention now on the subject of traffic safety, we see a growth of attention paid to it that parallels the growth of the automobile.

One way of studying this growth is to examine the ways in which it was brought

[1] R. H. Gocker, "A Unit on Traffic Safety," *School Science and Mathematics*, No. 5, Vol. 37:565–70.

to the attention of the public. This was done largely through magazine articles of the day. Such an examination reveals the number and nature of these articles for the period from 1900 up to the present time. A mere study of the titles of those articles is revealing as to the nature of the attack. These titles, as will be shown, change in color and in tone as the problem became more and more acute.

Prior to 1925, we find relatively few articles dealing with automobile accidents. For the period from 1900 to 1904 there were no articles dealing with the subject recorded in the *Reader's Guide*. For the period 1904 to 1919, there were just nineteen articles appearing for the benefit of the general public. Those that were written may be represented by the following titles:

"Dangers that Beset the Modern Motorist"; "Family Use of the Automobile"; "Motorist and the Future"; "Preventing Accidents"; "Speed Factors in Collisions"; "Accidents Due to Foreign Chauffeurs"; "Slaughter on the Highway."

This last article appears out of place, and one wonders at the vision and foresight of its author. Upon examination of the article, however, one finds the title misleading. The author's journalistic powers to portray our present problem were apparently concentrated on, and had spent themselves, when the title was written. The article itself is a mild and commonplace description of the rights of the pedestrian.

In the next period, from 1920 to 1925, the articles take on the tone suggested by these titles:

"Make America Safe for the Auto Driver"; "Is the Motorist a Criminal"; "Towing the Wrecked Car."

Concern apparently was still centered around the owner of this uncertain mechanism. Would it hold together, and did the automobile have equal rights to the public highways along with the horse-drawn vehicles?

In the next period, up to 1932, the number of articles increased and now some concern was being given to the cultural aspects of the automobile driver. Put any mild-tempered, gentlemanly souled person behind the wheel of an automobile and he became lord and master of all he surveyed. A minor accident brought forth a volley of blame and abuse. Never a trace of decorum that a gentleman should possess and practice, could be found in this new man. The usual apologies were foreign to his new make-up. These articles are represented by the following titles:

"Consider the Other Fellow"; "Good Manners and Good Driving as the Safety Twins"; "Psychology and Highway Safety"; "Are You a Turtle Driver."

From then, up to and including 1934, the increasing number of accidents were apparently causing some concern. The articles began to take on the tone of those found in the succeeding period. These articles are represented by such titles as:

"Accidents Don't Just Happen"; "Night Time's the Time for Accidents"; "Autocides Overshadow Homicides"; "Automobile Deaths at a New High"; "Half of All Motor Accidents Happen to the Pedestrian"; "How Not to Be Run Over."

Although these titles hold some power to attract reader's little attention was apparently given them except by those directly concerned with the problem.

Recording Harrowing Details

In 1935 though, we notice a definite change. A few of the agencies that had been watching the automobile accident and death rates, were shocked by the rapid rate at which these figures were climbing. The deaths due to automobile accidents for the year 1935 were 36,000 as compared with 14,988 for 1922. The total number of deaths from automobile accidents for the period between those two dates amounted to 379,177.[2] Besides these death figures, attention was also attracted to these other facts. In 1935: 107,000 persons were hopelessly maimed, 1,170,000 persons were seriously injured, and $1,600,000,000 was the loss in earning power due to automobile accidents.[3]

Something drastic had to be done. The public had to be made aware of the situation.

The editors of the *Reader's Digest* had an inspiration. They hired J. C. Furnas, a young Harvard graduate, to investigate accidents, visit hospitals and morgues, and then turn his journalistic powers loose on a description of what he saw, in such a manner that the effects of his writing would wake up the nation. His article, "And Sudden Death," that appeared in the August, 1935, number of that magazine not only woke up the country, it set it on fire. It was the subject of newspaper articles and editorials all over the country, thousands of reprints of the article were distributed by insurance companies, by safety, civic, social, religious, and law-enforcement agencies. Beyond that, the blood of other writers was fired with the ambition to imitate and even to surpass this first, pace-setting article. The articles that followed, just as this first one, were replete with rending crash of twisting metal, the rattle of splintering glass, bodies lacerated, harpooned, and torn to pieces, a vivid description of limp bodies that vomit blood. These articles are represented by the following titles: "After Sudden Death"; "And Sudden Suicide"; "And Why Not Sudden Death?"; "Blood and Agony"; "Death and Company"; "Stop the Slaughter."

Another contrast, which was mentioned before, might be shown in the number of articles recorded. As previously stated, for the nineteen-year period — 1900 to 1919 — there were just nineteen articles recorded in the *Reader's Guide*. For the one-year period — July, 1935, to June, 1936 — in the same source, there were forty-five such articles listed. For the next six-month period, this *scare* urge was just finding its stride, and we find thirty articles, most of which are written in this same gruesome style.

Other agencies took up the fight and carried it along in this same manner. Newspapers not only gave more space to the cause but added *flavoring* to the details. *The Chicago Tribune*, to cite one example, started its "Massacre Chart," a clocklike picture whose hands *Death* and *Accident* progressed around their orbits as automobile accidents occurred.

Movie and Radio Appeals

Movie producers made short reels showing, realistically, the details that Furnas and others had written about.

The radio started broadcasting brief appeals and realistic crash skits. Time was given to the broadcasting of accident cases in traffic courts. Some of these featured the sentencing of traffic violators to inspection tours of the accident wards of hospitals.

This scare method continued in full force on into 1936. The situation had been called to the attention of the public. The results of this campaign were not so definite and opinions differed as to the positiveness of the results. Some quarters showed marked decline in the number of accidents, others registered no change, while still others presented a continued climb of the accident rates.

Up to this time, the work of traffic safety had been largely through the activities of the National Safety Council, the National Conference on Street and Highway Safety, the insurance companies, state motor-vehicle departments, and police organizations. The Education Division of the National Safety Council, for example, had carried on a program of pedestrian safety in the schools since 1922 that had been highly successful. The insurance companies had distributed tons of literature and posters over the country. The time was ripe for the leading manufacturers of automobiles to take an active part in the campaign. They were brought together in what is now called the Automotive Safety Foundation with a budget of

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[2] Travelers Insurance Company, *Live and Let Live 1936*.
[3] Figures compiled by American Automobile Association.

several hundred thousand dollars set up to organize a firm attack on safety.

Out of a meeting of the leading manufacturers of automobiles came a verdict that though the public had been told about the seriousness of the matter in no uncertain terms, the campaign had already served that purpose and had overshot its aim. They presented the thesis that the whole scheme was based on bad psychology and had developed to the point where it was doing more harm than good. Their claim presented the argument that the scare technique was driving the careful, but timid driver off the highway, and was having no effect upon the hardened, reckless driver. These manufacturers advocated a new technique of safety education, based on the theory that before there can be a cure of an evil, there must be an understanding of the causes and circumstances.

The Harvard University Bureau for Street Traffic Research was reorganized with an enlarged program, the Institute of Public Safety for training police officers at Northwestern University was set up, the American Automobile Association was given a grant for driver-training work. Added to these, the Automotive Safety Foundation made grants to the American Legion, the National Congress of Parents and Teachers, the National Grange, the American Association of Motor Vehicle Administrators, and other national agencies. Each one of these organizations prepared a carefully planned attack on the problem through scientific methods.

The National Conservation Bureau, supported by sixty insurance companies, intensified its program and prepared a statewide program of "Creating Safer Communities" which was adopted by some thirty-two states. Many other agencies threw their weight behind the combined front of the national and local organizations. A sound attack on traffic accidents was on. The nation had realized for the first time that accidents could and must be reduced.

From these studies, three main factors stand out most prominently:

1. *The Car.* Few cars today, except those that have lived beyond their life expectancy, and those that do not get necessary attention and repairs, can be blamed for accidents. Cars are much better built, and are much safer today than they ever were in the past. Although cars can and do travel at much faster speeds today, they are relatively safe and can be controlled at high speeds. To aid in this campaign for safety, car manufacturers pledged themselves not to mention speed in their advertising for the new models.

2. *The Road.* Although rapid strides are being made in certain parts of the country to remedy faults brought out in various surveys, there are still many roads that were built for cars that traveled forty miles an hour and are now being used by cars traveling sixty to eighty miles an hour. Roads are still too narrow for the increased amount of traffic.

3. *The Driver.* Contrary to common belief, time spent in driving, distance driven, and no-accident records do not imply good driving ability. Most accidents today can be traced to poor driving techniques. It is here, then, that most attention, so far as the general public is concerned, must and is being centered. Many agencies are co-operating in the drive to better educate the American public in the techniques and methods of safe driving habits. The public school has come to be considered as one of the best and logical places in which to conduct this education.

Traffic Safety in Public Schools

That driving and traffic-safety education is getting some attention in the public schools is evidenced by the number of articles appearing in educational publications during the past two years; by the fact that the third general session of the Department of Secondary School Principals of the National Education Association at New Orleans in the spring of 1936 was devoted entirely to safety, and most of the papers of that program were confined to traffic safety; and also by the increasing number of schools that are adding such work to their curriculums.

At the New Orleans meeting, the need and value of placing traffic-safety education in the high-school curriculum was brought out very emphatically by Miss Agnes Samuelson, State Superintendent of Public Instruction of Iowa, and past president of the National Education Association, who said, "The school program must expand to include safety instruction on the secondary and teacher-training levels, if the war on accidents is to be a war. The annual death toll of 36,000 lives and over a million injured in highway accidents is exactly that many too many. It cannot be postponed if the young learners are to have experiences that will guide them for safe and adventurous living. If the school is to train for life — and that is the nucleus of our favorite definitions — it dare not blind its eyes to the educational aspects of the highway safety problem or shift the responsibility of tackling them. . . . It cannot overlook the environment in which these young learners live — 27 million motor vehicles with 40 million drivers burning up 16 billion gallons of gasoline to travel 200 billion miles a year. This young generation must be safe as it goes places and sees things enroute to take its place as adults in a world where time and distance have been conquered by radio and the stream line.

"To teach these young learners the proper use of the great new instrument of modern civilization is one of the tasks of education. Call it values, discrimination, or control, as you prefer — the best way to freedom is through intelligent discipline. . . . These new tools can take us to greater heights or lower depths depending upon their use or abuse. The young drivers and airplane pilots must have attitudes, knowledge, and skill if they are to sit at the wheel and controls."[4]

At the same meeting, Mr. Albert W. Whiting of the National Safety Council, after showing the need of modern society adjusting itself to an automobile age, also stresses the need of starting an educational program in the schools. He says, "In our mentality and psychology regarding the automobile we are still in the horse and buggy stage. This is not only in our failure to make the driver responsible through adequate driver license laws, but in our failure to provide training not merely for living in the automobile age but even training for driving. Our delinquencies go even deeper than that however. We don't understand how to approach the problem. We are at a stand still at the present time because we believe it cannot be solved. The problem can be solved, but if it is to be solved, training courses for living in the automobile age must be given, together with actual instruction in driving.

"Such courses not only belong in the field of education, but they belong in the high school. This is a job that the high school must perform for society."[5]

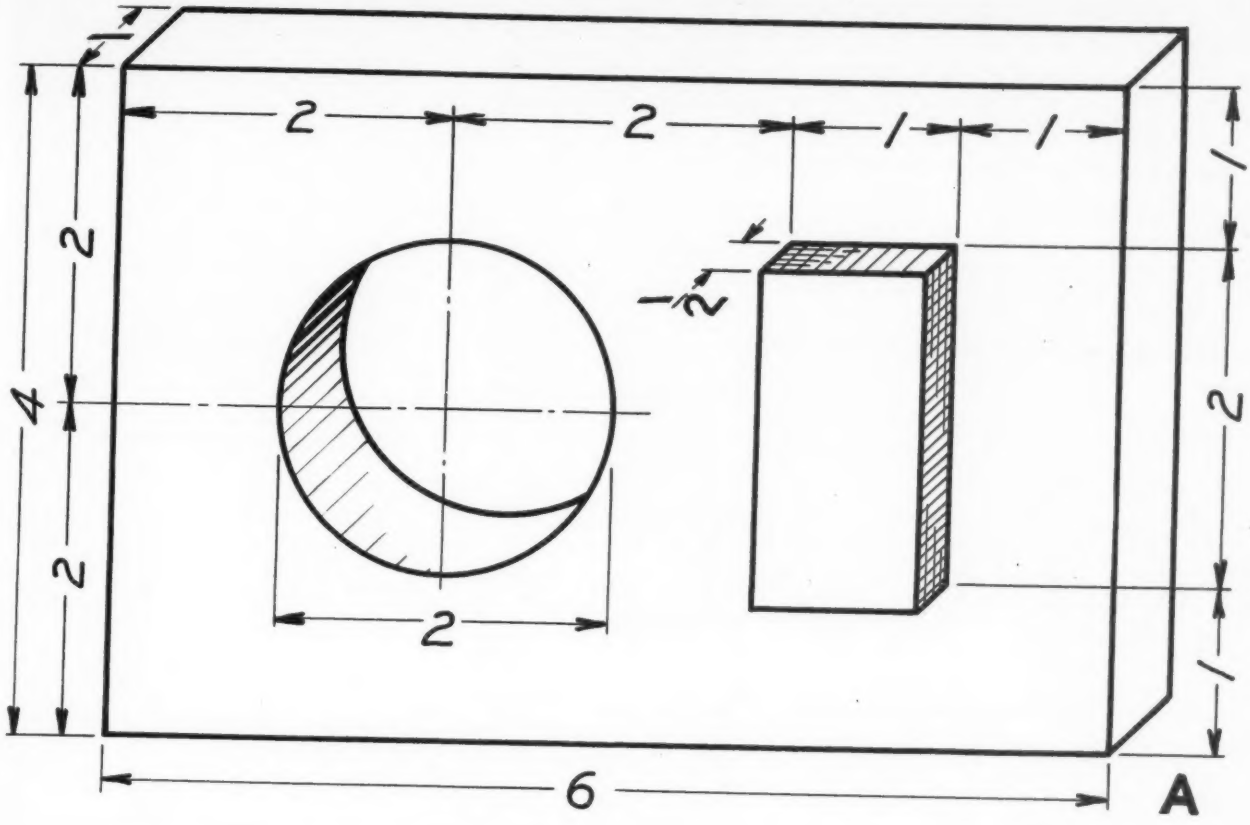
Until every high school in the country has incorporated in its course of study such work in safety education, these appeals must be made. When we consider the amount of inertia that exists in the public schools of this country, and the difficulty that is usually experienced in adding a subject to the school curriculum, and when we consider what has been accomplished for safety education in the short period of two years, we should feel that the efforts in behalf of this phase of education have been highly successful.

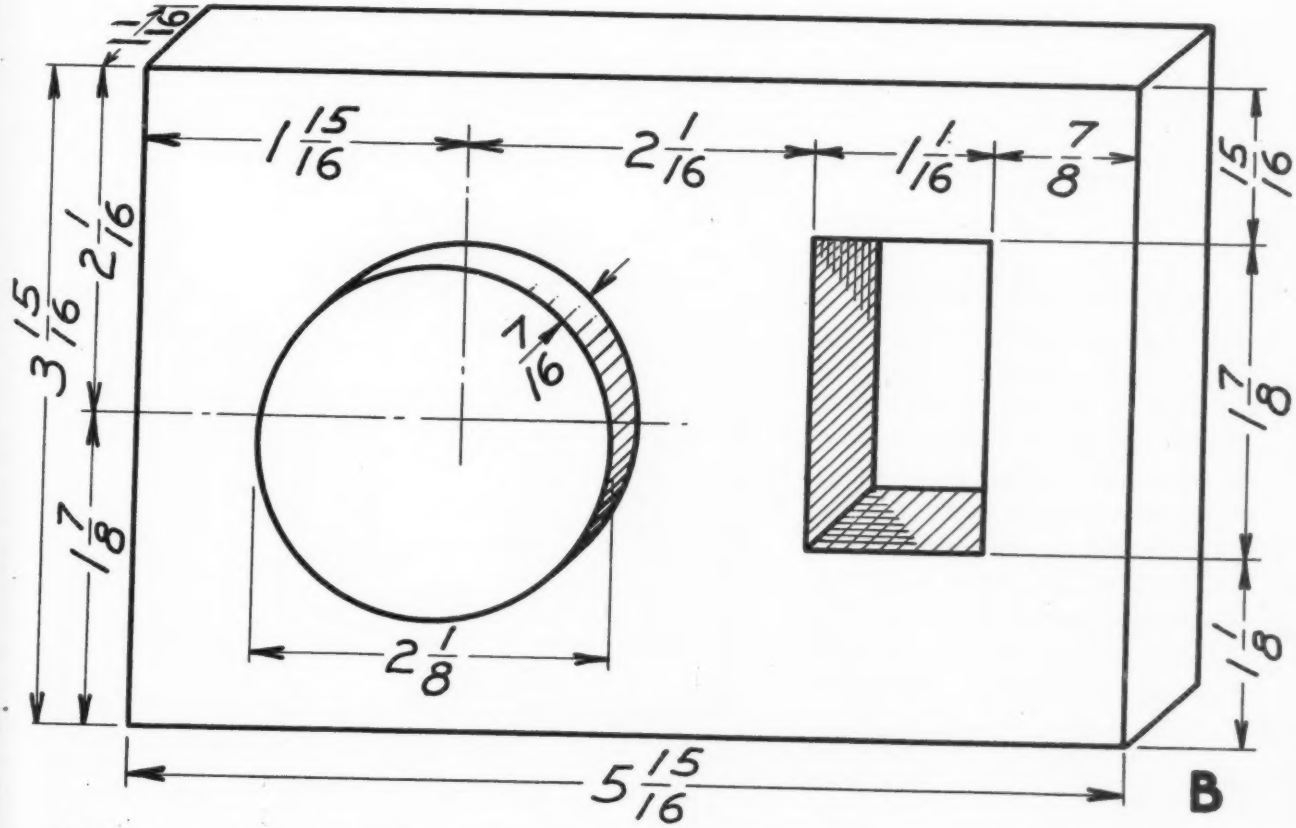
Professor Amos E. Neyhart, now at Pennsylvania State College, who directs the driver-training activities of the American Automobile Association is credited with the pioneering of driver training. In 1931 he "conceived the idea that since sound training was successful in producing more skillful workmen and reducing accidents in factories, a training plan for automobile drivers should produce the same results. Investigating the methods then in use for preparing persons to drive, he dis-

[4]Agnes Samuelson, "Next Steps in Teaching Safety on a Secondary Level," *Bulletin of the Department of Secondary School Principals of the National Education Association*, No. 65, Vol. 21:28–33.

[5]Albert Whiting, "The Secondary School and Traffic Safety," *Dept. of Sec. Sch. Prin. N.E.A.*, No. 65, Vol. 21:33–4.

(Continued on page 434)

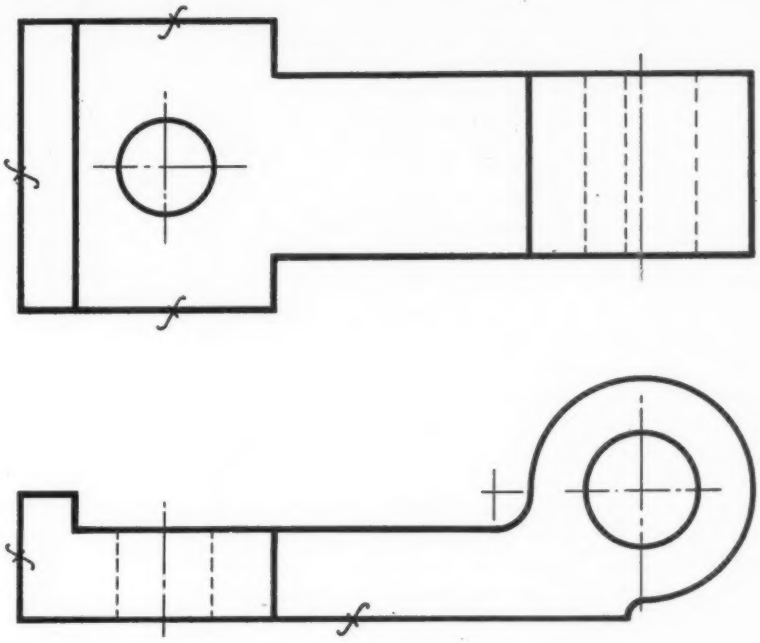


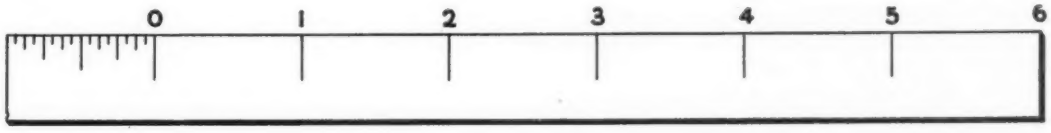


Scale-reading test, by W. W. Sturtevant, South High School, Minneapolis, Minnesota (for explanatory material, see page 436)

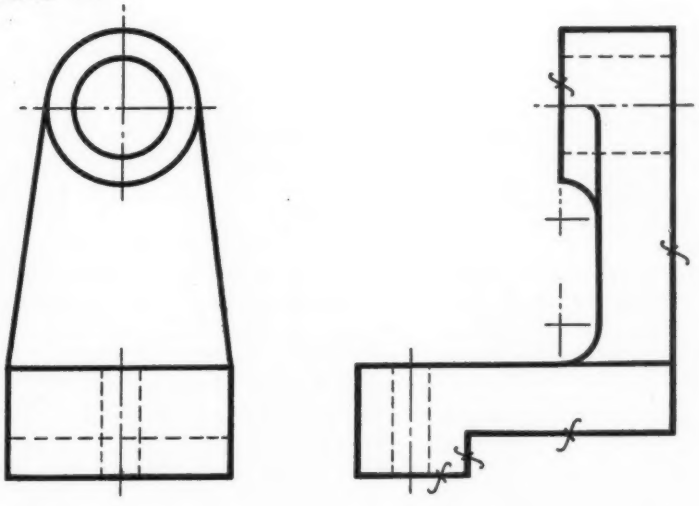
Dimensioning Tests for Mechanical Drawing

PART 1





PART 2



DIRECTIONS: Divide the space within your border line into two equal parts, and make two working drawings completely dimensioned to the exact size given. Definite dimensions may be found by placing the dividers on the working drawing, then placing the points on the printed scale to find this distance in inches and fractions of an inch. Obtain all dimensions in this way. Put in all notes indicating drilled holes and finished surfaces where necessary.

I. A. V. E.

Submitted by Harry W. Kroll, Senior High School, Rockford, Illinois

INDUSTRIAL ARTS and VOCATIONAL EDUCATION

J. J. Metz, Editor

Is Education Eating Up Life?

In an exceedingly interesting article entitled "Is Education Eating Up Life?" which was published in the *New York Times,* a well-known writer deplores that education is gradually depriving the "plain man" of more and more of his life. In this article, the writer says that fifty years ago people began their real lives while still young. By the age of thirty, they had got somewhere, or nowhere. He states that they learned spelling at six, went to high school at twelve, taught school on a third-class certificate at sixteen, worked for two years in a sawmill, and spent two at a medical school and then blossomed forth as doctors. Or they spent one year in a sawmill and one in a divinity college, and then they were ready to preach the gospel. For law, they needed no college at all, just three summers on a farm and three winters in an office. He states further, that all great men in North America got their education in this way.

It may be well to see where this line of thought leads. Some of us attended school fifty years ago and many of us belonged to the "plain people" then, and for that matter, still do. Our parents, for the most part, had comparatively little education, but they did want their children to have the advantages of which they had been deprived. It is true that many of the youngsters at that time left school at the earliest permissible moment. A certain number of them, however, finished elementary school at the age of thirteen or fourteen, entered high school and graduated from that at seventeen or eighteen. The more fortunate ones even went to college and were ready for what life had to offer at twenty-one, twenty-two, or twenty-three.

A goodly number, of course, never went beyond grade eight. Some of these became excellent mechanics, businessmen, politicians, and civic leaders. A certain percentage fell by the wayside and became human derelicts. Some made money, many more did not. Others got their education the hard way. It was not at all so simple as the method described in the article alluded to. One of the boys who attended school fifty years ago and who is now a power in the city in which he lives, graduated from the elementary school and then went in search of a job. He worked at unskilled and semiskilled laboring jobs for a number of years. While not working in a sawmill, he spent several years in a flooring mill. He then attended evening-school sessions offered by a business college. This he did for several years while working during the daytime, and in that way acquired some of the high-school subjects which he had never had. Then he took a civil-service examination and fortunately got an appointment in the railway mail service. The wages he earned were high enough to enable him to marry. Then he started to study law in his spare time. It wasn't only for a year or two. It took great courage and stick-to-it-iveness, but he persevered and finally passed the bar examination. He still held on to his railway mail-service job and in his spare time worked in a lawyer's office. He was getting law experience, and finally when he thought he had sufficient of that, he left the government service and started practicing law. Education did not eat up this man's life, but it took almost superhuman effort for the man to get his education. Many more such cases could be cited. There is one instance where a married laborer in a contractor's gang studied medicine evenings, not for one or two, but for enough years to kill the ambition of anyone not built of very stern stuff. In the end he passed the medical examination, began his career as a family practitioner, and built up a large following. Then, there were others, clerks and helpers, who took correspondence courses to augment their elementary-school education until they could advance step by step to higher positions. All of these belonged to the "plain people." All of them have given their children the best educational opportunities because they felt that the manner in which they had obtained their own education was too hard and discouraging a road to travel.

Of course, one may argue that since then much of schooling has become compulsory. The plain man must take education willy-nilly. The age limit at present is eighteen in many states for those who have not finished high school. Would it be well that these laws be altered? Are these students being given the right kind of education? Is the solution given in the article "How to Keep Education from Eating Up Life," written by the same author, the right solution? Who knows?

Industrial and financial leaders are unable to unravel the weird catastrophe that has paralyzed our economic life. Probably it is well, therefore, that education holds youth for a few more years before he is thrust out into a world which has been set on edge by the men who got their education fifty and sixty years ago, and who now find that their education is insufficient to help them place the world back into normal running order.

Little is gained by quarreling with education because it presumably takes too much of youth's life, if we have not solved the problem what to do with youth after he is through with education. It is far better to look upon education, and upon all human endeavors, as being permeated with human imperfections. Education, now as in the past, needs constant scrutiny, adjustment, and improvement.

In spite of this, it is certain that never before did the plain man have the educational opportunities which are now offered him. Whether the offering is too great or not great enough is not readily determined. Education, however, is making a real attempt at present to help all young men and women, not only the favored few. If education holds them probably longer than it should, we who went to school fifty years ago ought to be thankful, for life does not seemingly have a place to put the youth now coming out of school.

When Industry and the School Work Together

Industry needs workers that are adequately trained. The school is striving to provide what industry needs. What is more logical than for both to compare notes, so that the product of the one will fit the needs of the other?

In Baltimore, this idea has probably been carried further than elsewhere. Last year a program was instituted following a discussion between Dr. D. E. Weglein, Superintendent of Education; C. W. Sylvester, Supervisor of Vocational Education, and officers of the Glen L. Martin Company. As an outcome of these deliberations, the Martin Company furnished twenty men who served as instructors on Saturday mornings at the Polytechnic Institute, teaching blueprint-reading courses to more than 400 students. This, without question, is an effective way of training our future workers.

(Continued from page 428)

covered that little, if any, systematic instruction of drivers was available. And pedagogically important, he found that the beginner acquired not only the good but the bad habits of his instructor."[6]

Safe Driving Instructions

Since that time, and due to a large degree to the efforts of the staff of the American Automobile Association, the National Conservation Bureau, state departments of education, and other state agencies, 500,000 students in about 8,000 high schools were given instructions in traffic safety last year.

One very important feature of the Neyhart Driver-Training System is its thoroughness. "Its basis is the principle that good driving cannot be learned by memorizing highway rules or by watching others drive, any more than it is possible to learn to swim without practice under proper guidance. . . . The course includes, first, a study of the mental, physical, and emotional characteristics of drivers as they affect car operation; second, knowledge of the car and its mechanical parts; third, skill in handling the car; and fourth, special habits and attitudes of safe behavior on the highways."[7] If we are to expect any definite results from traffic and safety courses, they must be conducted on the foregoing basis.

In 1937, Dr. F. R. Noffsinger, the educational consultant of the American Automobile Association conducted a survey to determine just how comprehensive is the study of traffic safety in the public schools of the nation. His study has been completed and copies of his findings may be secured from the offices of the American Automobile Association at Washington, D. C. To indicate just how important the subject is considered by the National Education Association, the 1940 Yearbook of the American Association of School Administrators will be devoted to the field of safety. This field was selected out of some fifteen subjects as one of the most vital for the consideration of school people at this time.

Comparisons of what is being done in this country with what other countries are doing is also gratifying. H. M. Vernon made a comparative study of safety education in the United States with that of England. He has this to say about the comparison, "The American child is much better instructed than the English child or the American parent. During the past five years, when fatal motor-car accidents generally have increased over 30 per cent, road traffic deaths among school children have declined 20 per cent. There is only one explanation; the effectiveness of the safety education in American schools. It begins with the teacher, some of whom receive instruction courses from public officers, while unemployed teachers are being trained in safety education and are then drafted for service in the playgrounds and schools. The children write safety essays and make graphs to represent local accident conditions. They trace the influence of geographical conditions on local traffic problems, and study the dangers peculiar to various forms of transportation. Outside the school curriculum they form clubs known as *safety councils* where they have talks, lectures, motion pictures dealing with safety. They choose suitable posters for bulletin boards, keep accident data relating to the children in their school, and forward them to the National Safety Council. Another activity is the school patrol or brigade, which assists younger children at street crossings by standing on the curb and giving *stop* and *go* signals for the children."[8]

Up to the present time, much of the work in traffic safety is done on a voluntary basis. Eleven states have laws requiring the teaching of safety, but these laws in most cases are confined to a general safety program on the elementary level and do not include driver training.

Some thirty-one states have now prepared official state courses of study in driver training, but as yet, the kind and amount of work offered depends upon individual school programs, equipment, and teacher preparation.

With the ever-increasing number of cars on the streets and highways, learning to drive by observation and practice cannot be continued. It now becomes the duty of some competent institution to assume the responsibility of teaching beginners how to drive safely and effectively. The school is that institution.

Studying City and State Regulations

Safety education, to be of value, must be practical. We must first know what causes accidents and then teach those things that will be most effective in curing those causes. A *study* of city and state traffic regulations, a *study* of *how* accidents happen is not sufficient to effect this cure. Actual driving situations must accompany this cure.

In those places where instruction is being given, Greenan found it conducted in three different ways:

1. All the students in a school, or a selected class are reached through the correlation of safety teaching with certain regular subjects, such as social studies, physics, and mechanics.
2. Intensive instruction is given to a limited number of students at a time through credit courses in automobile driving. Many now feel that a high school has not discharged its full responsibility until a course of sixteen period classes has been completed by every student. Such a course is supplemented by visits to a police station, traffic court, garages, etc.
3. *Extracurricular activities:* Home-room programs, student-safety council, motor traffic club, and drivers' school.

a) Home-room program. All pupils are included in a series of lessons on local traffic ordinances which are least observed. Other material is added if time permits.

b) Student safety councils. An organization, composed of representatives from each room and a faculty adviser, controls and develops the safety program of a school. Such an organization develops initiative as well as an active interest in safety.

c) Motor traffic club. Pupils who have common interest in automobiles organize to study various phases of the subject. In the high schools where such clubs have been organized, the interest has been so great that it has been difficult to keep the club from becoming too large. Their activities have included:

(1) Discussion of such subjects as special permits for student drivers, regulations for parking and driving by students, court cases.
(2) Driving courses for students.
(3) Publicity for problems and activities of the club through school paper, bulletin board, and radio.

d) The drivers' school. In the report of the National Conference on Street and Highway Safety (1934) the Drivers' School is thus described, "The drivers' school or instruction course is open to all students and is generally attended by those who are beginning or about to drive. It consists of a series of lectures, demonstrations, and discussions given generally once a week and for sixteen weeks. In some states these courses are carried on with the active co-operation of the motor vehicle department and lead up to the granting of drivers' licenses, where the students are of legal age and where this has the approval of the parents. This is a most significant movement and seems to indicate that the high schools of the country may generally assume the responsibility for teaching young people how to drive."[9]

[6] *New York Times*, Sept. 19, 1937.
[7] *New York Times*, Sept. 19, 1937.
[8] Vernon, H. M., *Accidents and Their Prevention.*
[9] Greenan, John T., *Automobile Travel*, Houghton Mifflin Company, p. 15.

(To be continued)

Our educative influence is determined by what predominates in us. We communicate to children less of what we say than of what we are, and if our moral path be crooked, it is useless to point out the straight and narrow way; the child holding our hand walks as we walk. — *Charles Wagner.*

I would have my children able at each moment from morning to evening to read on my face and to divine on my lips that my heart is devoted to them; that their happiness and their joys are my happiness and my joys. — *Pestalozzi.*

THE WORKBENCH IN FOREIGN SCHOOLS

J. I. Sowers, Miami, Florida

An interesting bit of news about the equipment and tools used in European school shops.

Our American teachers of industrial arts may be interested to note some marks of difference between the way our subject is taught in foreign schools. For instance, the bench used, while not a matter of great importance in itself, is nevertheless interesting because it is so different from the type used here.

In 1934, when gathering information about the subject of wood carving as taught in foreign schools, we also collected some pictures of boys at work. Some of these are present here. It will be noted that the type of bench upon which most foreign boys work is quite strange to most of us.

In Figure 1 is shown a sketch made of an assembly of these benches. It will be noted they are made up of units joined together in knock-down fashion, forming sometimes a double line, sometimes a single line, which accommodates itself to the size and shape of the room. The working surface of each unit is about 14 in. wide by 4 ft. long. Two vises are provided for each unit, one at the end which connects also with one or two bench dogs on either side of the bench.

Figure 2 shows a little Danish boy doing surface planing on a bench of this type. Note also the plane he is using. The common plane here is a wooden tool with a horn in front which is used as a handle. There is no handle in the rear, the hand being clasped about the butt of the plane.

Figure 3 shows another boy in the same school. This boy is using a saw of the type commonly used. It is not unlike our turning saw, but often has a wide blade.

Figure 4 shows a battery of the benches in line. The boy is shown taking a long stroke in surface planing. The side vise for doing edge planing is clearly shown. Note the saws of the type shown in Figure 3, hanging beneath the bench.

Figure 5 shows a number of the benches which we are interested in studying, and also a boy doing cut-off sawing.

Figure 6 is a Czechoslovakian youth working on the same type of bench, in this case doing concave chiseling.

One feature of these benches is their solidity when set up in continuous lines. These benches are found in use in the schools of many of the countries of Europe, and also in England.

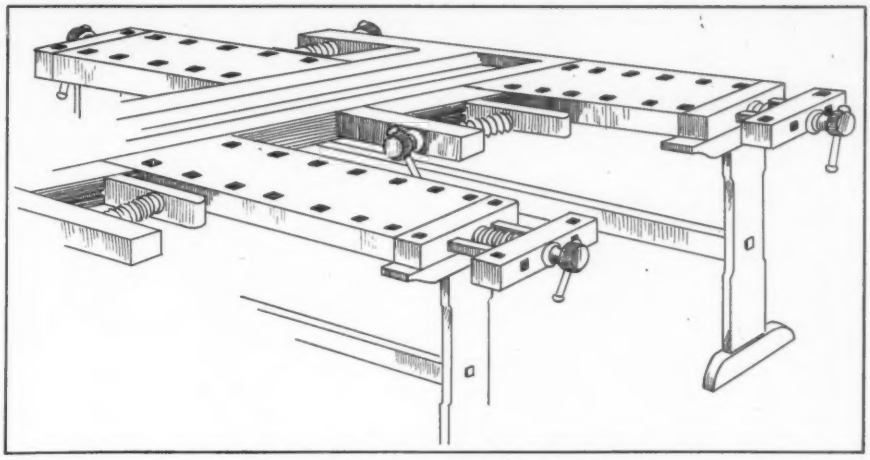


Fig. 1. Workbenches used in foreign schools

Views from foreign schools

It will be noted that the vises have wooden screws, as at one time had practically all the carpentry vises in the early days of this country. Iron vises are found, however, in some places, but seldom the rapid-action vise so common here, and with which the average boy can make such a racket in opening and closing.

Problems and Projects

READING THE DRAFTSMAN'S SCALE

W. W. Sturtevant, South High School, Minneapolis, Minnesota

(For drawings see page 429)

At various times in the past there have appeared in this magazine short articles describing teaching devices to be used in the mechanical-drawing room to teach the reading of the scale.

These suggest the use of enlarged scales used at the front of the room, mimeographed or blueprinted sheets with questions to be answered by pupils, and class drills designed to develop facility in reading the divisions of the draftsman's scale.

Many teachers do not devote any time to this type of drill and proceed on the assumption that few pupils encounter any difficulty in the actual reading of the scale when laying out a drawing.

This is not always the case, and the teacher of drawing may find if he gives a test that many pupils are confused and lose valuable time if requested to make drawings where they are required to draw to 16ths and 32nds of an inch.

The results of such a test given by the writer to pupils of his classes were rather surprising to him.

Cabinet projections of the two exercise blocks shown on page 429 were provided. Each required about the same amount of line work. On the drawing of the block, shown at *A*, the dimensions were given in even inches except in one case where ½ in. was used.

The dimensions on the block shown at *B* involve 16ths of an inch. The drawing of the block in even inches was drawn first, and a careful record was made of the time required by each pupil. Some days later a drawing was made of the other block, and again a record was made of the time consumed.

The drawings were made by 107 pupils. The average time taken to make the drawing of the block shown at *A* was 17 minutes, while the average time taken in drawing the other block dimensioned, was 25. In other words, it took 50 per cent longer to draw the second block.

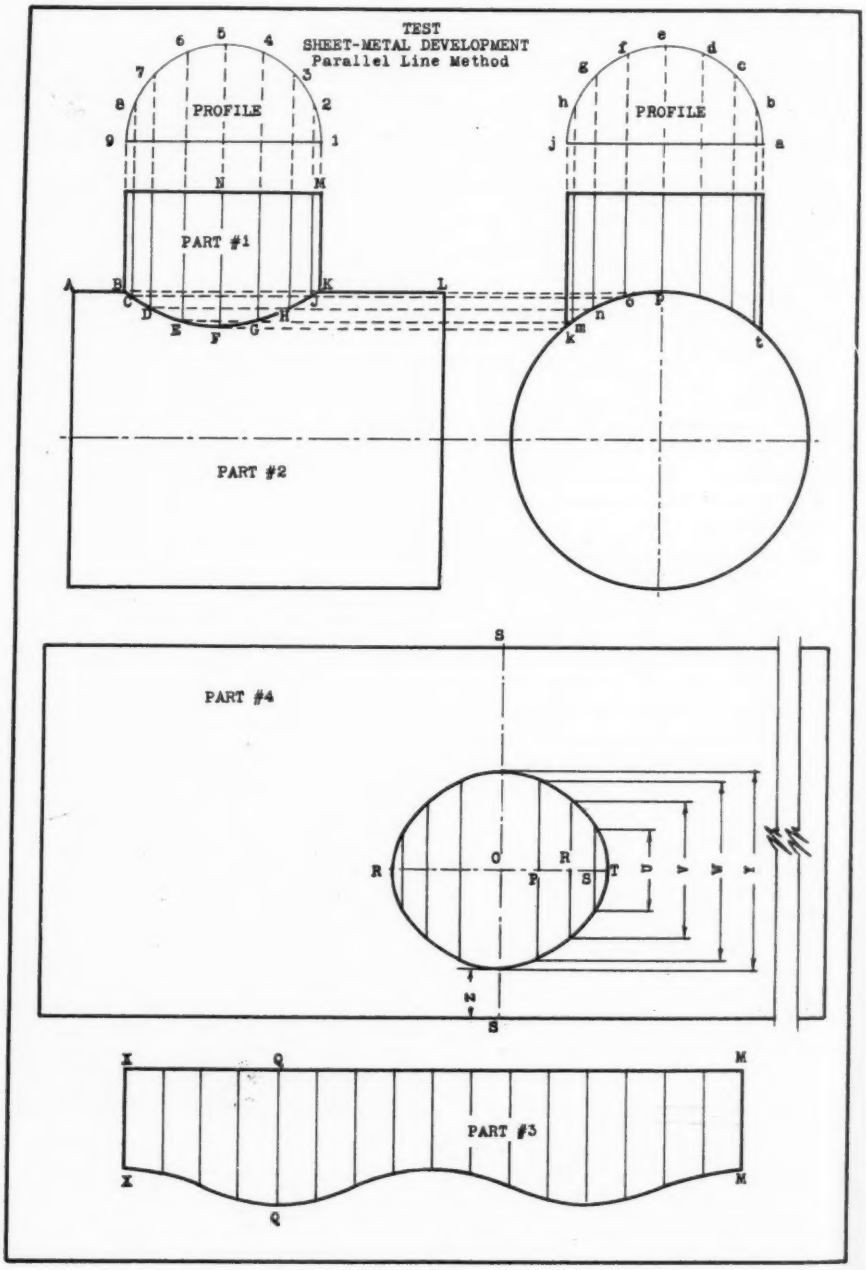
If these figures are at all typical of conditions existing in other classes, considerably more time could well be spent on drill in reading the scale. It might also be wise to see that exercises to be drawn by beginning pupils should be dimensioned in even inches where possible.

SHEET-METAL DEVELOPMENT TEST

C. R. Wells, Yankton, South Dakota

Parallel-Line Method

1. Give the number of the part that is the development of part No. 1. .....
2. What is the number of the part that is the development of part No. 2? .....
3. What line on the elevation is the same as X-X and M-M? .....
4. What line on the elevation is the same as center line S-S? .....
5. What space on the elevation is dimensioned Z in part No. 4? .....
6. What space on the elevation is the same as dimension U in part No. 4? .....
7. What space on the elevation is the same as space O-P in part No. 4? .....
8. What space on the elevation is dimensioned Y in part No. 4? .....
9. What space on the development is equal to n-o in the end elevation? .....
10. What space on the elevation is equal to S-T in part No. 4? .....
11. What space on the side elevation represents m-n in the end view? .....
12. How many equal spaces are there on the complete profile? .....
13. g-f is equal to what space on the other half profile? .....
14. What other line is equal to N-F in part No. 1? .....
15. Is the line M-K in part No. 1 a true-length line? .....
16. Is the arc G-H in part No. 1 a true-length line? .....



17. To what distance on the elevation is the center line R-T in part No. 4 equal? .....

18. Is the line n-o in the end view a true-length line? .....

19. Is arc B-F-K a developed miter line or the apparent miter line? .....

20. What is the circumference of part 1 if the diameter equals 5 in.? .....

TABLE LAMP AND ASH RECEPTACLE

John T. Marcason, Clara Barton School, Raritan Township, Perth Amboy, New Jersey

The combination lamp and ash receptacle described herewith is a very simple and yet extremely attractive and useful article. The combination is not constructed according to any particular period or style and fits in any setting very satisfactorily.

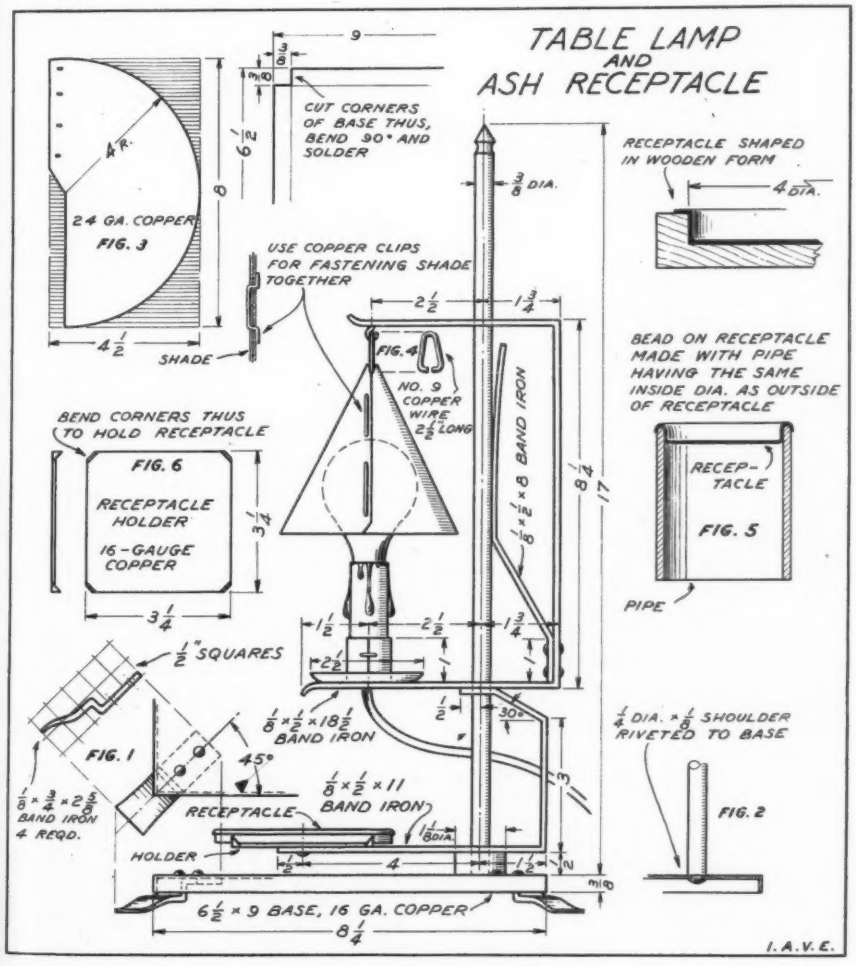
The center post or support arm acts as a pivot and the ash receptacle and lamp swing independently and can be placed in any position whatsoever.

Bill of Material

Name	*Material*	*Size in Inches*
Center post	Round iron	⅜ x 17
Shade arm	Band iron	⅛ x ½ x 18½
Pressure arm	Band iron	⅛ x ½ x 8
Link	No. 9 Copper wire	2½
Copper clips	24-gauge copper	2 pcs. ⅛ x 1½ 1 pc. ⅛ x ½
Shade	24-gauge copper	8 x 4½
Candle cup	24-gauge copper	1 x 3¾
Candle saucer	16 gauge	2½ square
Pull-chain candle socket		
Light bulb		40 watts
Gold silk lamp cord		12 ft.
Wall receptacle plug		
Ash receptacle	24-gauge copper	4½ square
Arm	Band iron	⅛ x ½ x 11
Receptacle holder	16-gauge copper	3¼ square
Spacer	Machine steel	1⅛ dia. x ½
Base	16-gauge copper	6½ x 9
Screw eye	Copper	½
Rivets	Iron	four ⅛ x ⅜
Rivets	Copper	eight ⅛ x ¼
Feet	Band iron	four ⅛ x ¾ x 2⅝

Procedure

Working from the list of materials, proceed to cut out the material required for the base. This is made of a 16 gauge by 6½ by 9-in. piece of copper. Cut a ⅜-in. square out of each corner and bend the two sides and the two ends over until you have a box with ⅜-in. sides and ends. With a soldering iron, soft solder the butt joints together smoothly from the inside.



Next, shape the four pieces designed for the feet. When shaped, two 9/64-in. holes must be drilled through each foot. Bisect the corners of the base, as shown in Figure 1, and place the feet with the center of the holes on the bisecting lines just drawn. Locate and drill the holes in the base, and rivet the feet in place.

Cut a ¼-in. diameter by ⅛-in. shoulder on the ⅜ by 17-in. piece of round iron that is to be used for the support arm. See Figure 2. At a point 1½ in. from one end and in the center of the copper base, drill a ¼-in. hole, and rivet the support arm to the base as shown in Figure 2.

Next, make the shade arm and the pressure arm. Pieces of ⅛ by ½ by 18½ in., and ⅛ by ½ by 8-in. band iron will be required. Drill all necessary holes and rivet the two together. The pressure arm should be shaped so that the pressure is enough to hold the lamp from slipping down the support arm when the lamp is moved up or down to various positions.

Next take the copper that is to be used for the candle cup and get a piece of pipe that has the same outside diameter as the outside diameter of the candle socket and shape the copper on the pipe. Then take an 8d nail and flatten and sharpen the point to a chisel edge, making sure that the chisel is only ⅛ in. wide. This nail serves as a tool for cutting the holes for the copper clips that are to be used in the cup and on the shade. These clips are to be made of 16 gauge by ⅛ by ½-in. copper. They are used as shown in the sketch near the layout of the 24 gauge copper lamp shade.

Next cut the copper for the shade as shown in Figure 3. Bend it into a conical shape, and clip the two lapped edges together. Then shape the copper to be used for the link as shown in Figure 4. Drill the two holes in the shade for the link and put the latter in place as shown in Figure 4.

The ash-receptacle arm requires a piece of ⅛ by ½ by 11-in. band iron. Bend this to shape and drill the required holes in it.

The copper ash receptacle is shaped in a wooden form, using a ball-peen hammer. After this receptacle has been shaped, form a bead on it, using a piece of pipe as shown in Figure 5. While shaping the receptacle, it is very necessary to anneal the copper frequently.

The receptacle holder is made of a piece of 16-gauge copper 4½ in. square. Bend up the corners of the holder as shown in Figure 6, so that the receptacle fits snugly between the prongs. Then rivet the holder to the arm as shown in the illustration.

Make the spacer out of a piece of 1⅛-in. round iron ½ in. long. Locate the center and drill a ⅜-in. hole. This piece is then placed between the base and the receptacle arm.

To finish the project, steel-wool all the copper parts thoroughly, and give them a coat of clear lacquer. Paint all iron parts with flat black paint. Put on the imitation-candle electric-light socket.

Complete the lamp by connecting the extension cord, with plug attached, to the candle socket.

COPPER CANDLESTICKS

Leon H. Baxter, Association for Crippled and Disabled, Cleveland, Ohio

Russian Candlestick

The Russian candlestick illustrated and described herewith is a little more difficult to make than those described previously in this series. It requires some accurate bending and fitting and has a brass reflector.

The base *C*, is a 6¼-in. disk of 18-gauge copper. The edge must be filed true and square and the upper surface planished with the round end of a planishing hammer. If the disk has a tendency to buckle after hammering, it is due to the fact that the copper has become hardened through pounding and must be softened by annealing, after which it may be easily flattened by pounding with a fiber mallet.

Next cut a 5⅛ by 8¾ in. rectangular piece of 18-gauge brass. Measure 6 in. from one end on both of the long edges. With a compass, set at a 2½-in. radius, strike an arc from this point to the center point of the end. Do this from both sides to complete the outline. Saw out this curved edge and file true and smooth.

Locate the rivet holes at the points shown in Plate 4, and drill a hole just large enough for a rivet ⅛ in. in diameter to pass through.

The circular rim *B*, is next made of a piece of ¾ by 14¼ in., 18-gauge copper.

Bend this around the edge of the base by hand, and cut off the ends squarely so that the adjacent ends will meet snugly. Planish on both surfaces. Then wire the rim in place, apply flux to all contacting points and place small bits of solder at the points where the two ends of the rim join and also about ⅜ in. apart along the inside edge where the rim joins the bottom disk *C*. Apply the heat to the metal and solder all these parts at once. In fact, the candleholder *D* and the drip pan *E* might all be soldered at the same time.

The candleholder *D* is made by either method described in the directions for the making of the first candlestick, and the drip pan *E* is a circular disk of 18-gauge copper, 2¾ in. in diameter, with the hole cut about 13/16 in. in diameter, or of a size to just fit over the top of the inner diameter of *D*. Both *D* and *E* are planished before soldering.

The handle *F* is made of a ¾ by 12-in. piece of 18-gauge copper. Planish this on both surfaces and edges. Anneal and bend in the form of the scroll shown. The upper curve is formed over a piece of 2-in. pipe, while the lower curve is formed over a 1-in. piece.

Next take the reflector and bend to fit the contour of the rim *B*. As the reflector is to remain smooth it must not be hammered with either a fiber or a rubber hammer. It should be formed over a cylinder of about 3-in. diameter and it is well to bend it to a slightly smaller curve than *B*, so that it may be sprung in place for a close fit. Place *A*, against rim *B*, and mark the rivet holes. Bore these holes carefully in *B*, to coincide accurately with those in the reflector, and rivet the two together. Place the handle *F*, against the reflector at its central vertical axis, and about ¾ in. from the lower edge. Mark the points where the handle contacts *A*, and drill the rivet holes in the handle. Replace the handle in its former position and mark and drill the necessary holes in the reflector, then rivet the handle to the reflector. Clean all parts of the candlestick with No. 2/0 steel wool. If the candlestick is to be fumed, it is well to protect the brass reflector from the action of the ammonia, as this will save much repolishing after removing from the fuming jar. This is done by melting some paraffin, heating the reflector slightly, and covering the entire reflector surface with paraffin put on with a soft brush.

After removing from the fuming jar, the paraffin is removed with a rag dipped in turpentine.

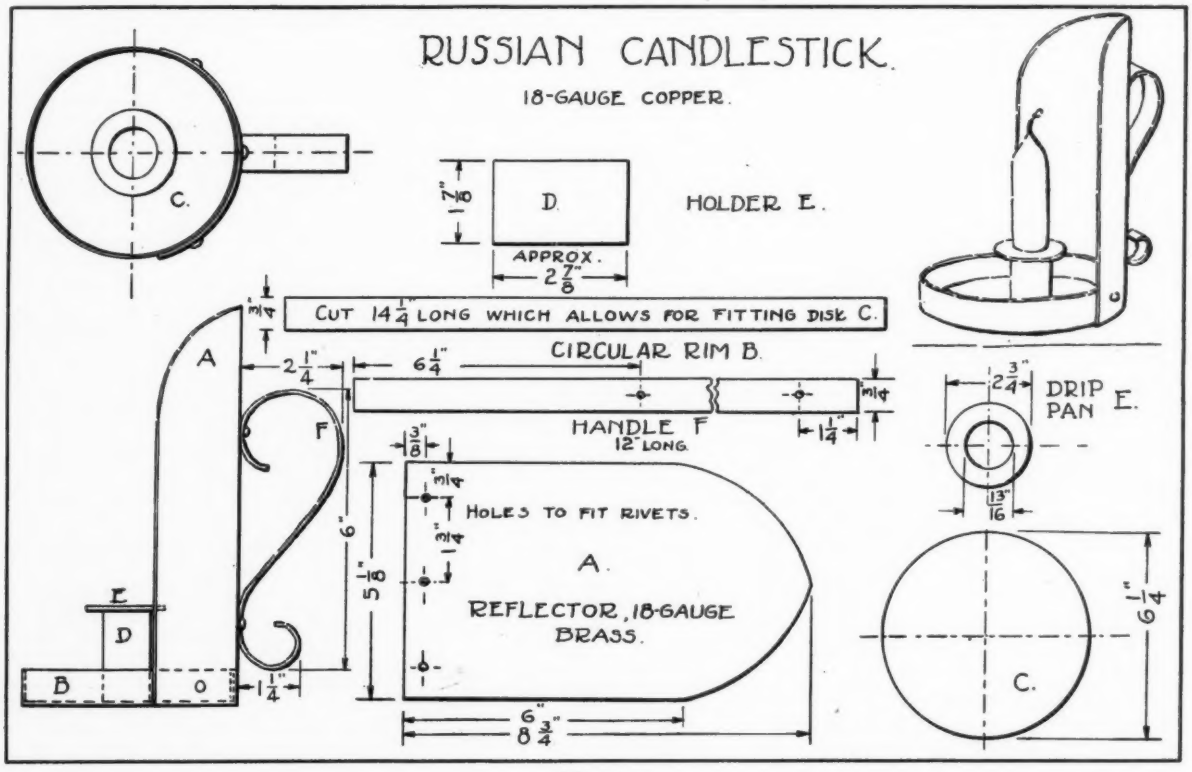


Plate 4

FIRESIDE CRICKET

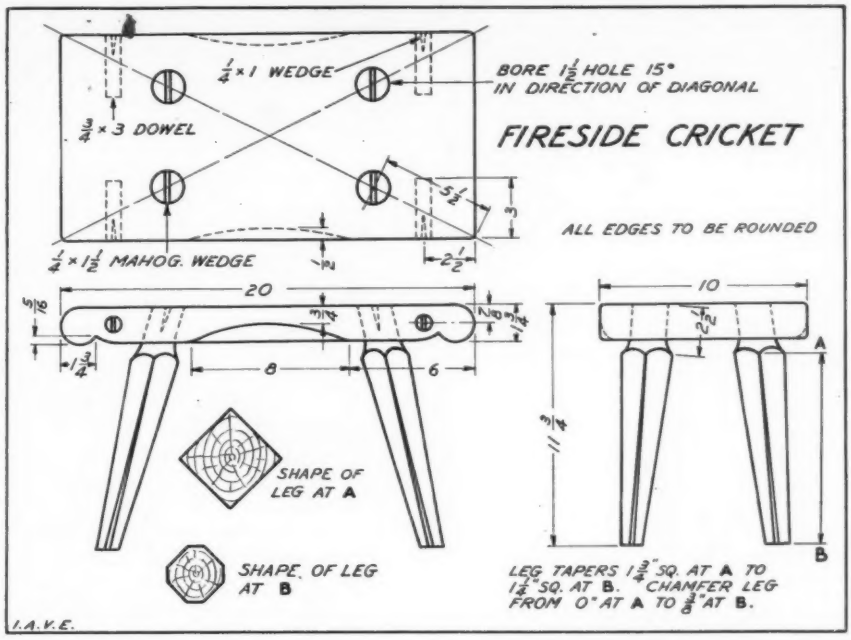
Ralph M. Merry, High School, Malden, Massachusetts

The fireside cricket shown herewith makes a very interesting project which will fit into and be welcomed in most homes.

It may be made of white pine, yellow pine, or New England knotted pine.

Method of Procedure

1. Square up the material for the top.
2. Draw diagonals with a pencil on the face of the top that will form the underside.
3. Bore the 1½-in. holes for the legs. These are to be bored 5½ in. from the corners, and they should slope outward at an angle of 15 deg. with the vertical, in the direction of the diagonal.
4. Bore the four ¾-in. holes in the edges as shown.
5. Shape the ends and sides as shown.
6. Square up and shape the material for the legs. The upper part of the legs may be turned or whittled to fit into the top.
7. Cut the saw kerf for the wedge into the leg tenons and make the wedges.


FIRESIDE CRICKET
¼ × 1 WEDGE
¾ × 3 DOWEL
BORE 1½ HOLE 15° IN DIRECTION OF DIAGONAL
ALL EDGES TO BE ROUNDED
¼ × 1½ MAHOG. WEDGE
20
10
8
6
SHAPE OF LEG AT A
SHAPE OF LEG AT B
LEG TAPERS 1¾" SQ. AT A TO 1¼" SQ. AT B. CHAMFER LEG FROM 0" AT A TO ⅜" AT B.
I.A.V.E.

8. Cut the dowels and wedges for strengthening the top.

9. Glue the legs and dowels in place. Drive all of the wedges so they are at right angles to the grain of the wood in the top piece, to avoid splitting.

10. When the glue has dried, plane off all surplus stock on the legs and dowels.

11. Cut off the legs so that the stool stands level.

12. Round off all edges to a ⅛-in. radius. Sandpaper the stool well.

13. Stain with burnt umber thinned out with linseed oil and turpentine. After 24 hours of drying, sandpaper with 2/0 sandpaper, and rub with linseed oil to produce those old, rich, variegated tones of brown. Shellac four or five times, rubbing down each coat with 2/0 sandpaper. Finally, apply a good grade of varnish, and rub down to a satin finish.

CARVED WOOD PLAQUE

D. W. Prince and Silvio Marini, Braintree, Massachusetts

Few woodcraft pieces show to advantage like a carved plaque exhibited on the wall—lighting effects bringing almost lifelike relief to the scene portrayed. Witness the rich appearance of the plaque shown at A in Figure 1. Here highlight staining of the wood and the room lights combine to bring out the contours of the figures. The galley in this plaque is typical of the cargo boats used during the marine supremacy of Egypt.

The construction of such a plaque need not involve any great amount of work, as roughing out may be done with the aid of a drill-press bit, set to a depth stop. Cherry was the wood used in this particular piece, but any attractive, close-grained wood may be employed, such as maple, birch, mahogany, or walnut. Choice pieces of stock for this purpose are often found in pieces salvaged from old furniture. The method of procedure is easy to follow. Square up a piece of wood 1 by 13¼ by 13⅞ in. Transfer the design to its surface with a carbon after having drawn it on a sheet of paper, using 1-in. squares. See Figure 2. In roughing out, the only lines necessary are the big bulk contours, such as the frame effect and the general rough form of the area occupied by the ship. Gouges and chisels may, of course, be used for this step instead of a drill press. In this event, hold-downs and clamps secure the stock to the bench as shown at C, in Figure 1. The thinnest portion of the wood in the bottom of the plaque should be at least ⅜ in. The semi-finishing step is carried out with care in locating and preserving the major points and general proportions of the finished plaque. Medium-sized carving gouges are used for this, and necessary lines are put on with a pencil as the work progresses. The background for the vessel consists of slight ripples to give an effect of small, wind-blown clouds.

Using finer chisels and gouges as the work progresses, the plaque comes to life in the realistic relief of the figures. Undercut the forms as much as you deem good practice, so that they will stand forth almost fully sculptured, leaving, however, backing for delicate parts such as shrouds and oar sweeps. The illustration at A in Figure 1 serves as a guide to the degree of relief to be given for each part.

Although not the best practice, should a small part break away, plastic wood may be brought to the rescue in fixing up discrepancies. With fine sandpaper or steel wool go over the entire plaque, rubbing down any sharp edges and then dusting well with a soft brush or jet of air. Linseed oil and umber make a nice highlight effect if not overdone.

Figure 1. A Carved plaque. B. Using the drill press to rough out the plaque. C. Putting in the fine details with chisels and gouges

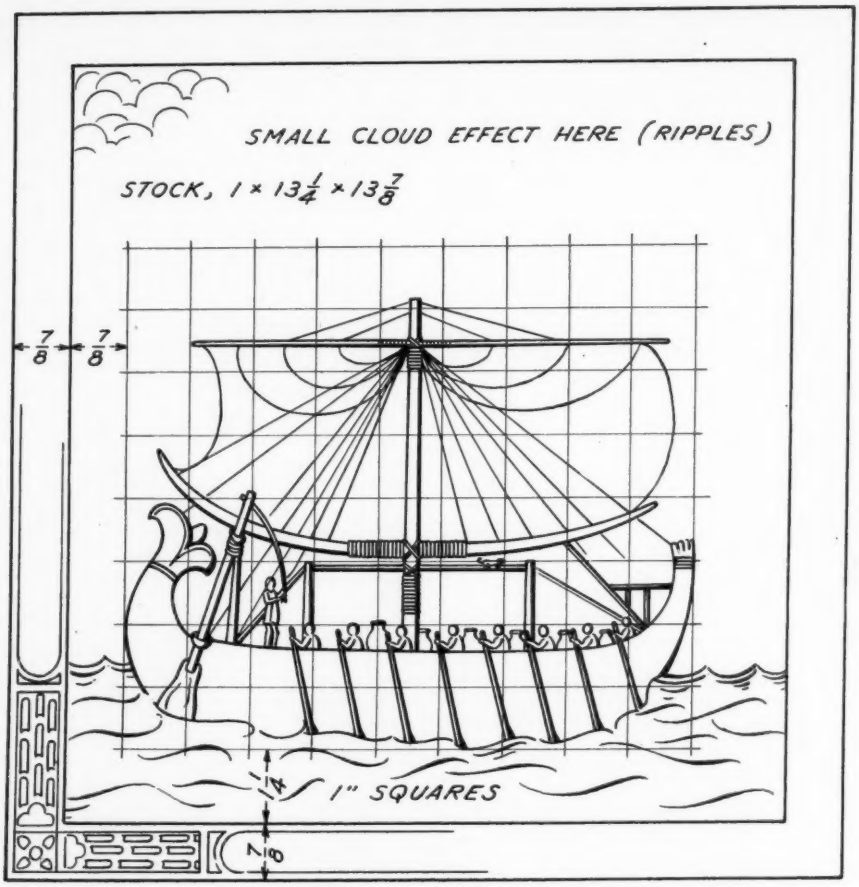


Fig. 2. Laying out and carving the plaque

This is applied with a cloth or a brush, according to the shape of the surface being treated. After being allowed to penetrate a bit, the surplus is wiped away. Furniture wax gives a durable last coat. Picture wire and screw eyes are used to hang the plaque, the wire being put on so that it is hidden. Pleasing lighting effects may be secured by tactfully locating the plaque between, say, two wall-bracket lamps.

AN AID TO FREEHAND SKETCHING

H. S. Fox, Miami, Florida

Very often the student or craftsman desires to sketch from nature as an outlet for artistic ability, or for utilitarian purposes. He may desire to make original sketches of trees and other details to be used as design motifs for craftwork in the shop. If he does not have access to an art school, he is at a loss to know how to make such sketches with any degree of accuracy. He can overcome this obstacle, however, by using the composition finder described herein.

There are many tricks, not only in creating compositions, but in seeing compositions as well. When we speak of composition, we include everything from the broad landscape with distant hills and lakes to the close-up study of a flower or tree, and the rules that apply to one also apply to the other. They apply to designs also that the student may work up from material taken from nature.

Some of the general rules for good composition may be listed as follows:

1. Do not divide the picture horizontally or vertically directly at the center.
2. Do not have the point of interest in the picture directly in the center.
3. Avoid monotony of form or color in the pattern or in the forms making the picture.
4. Avoid having areas of the same size or one half the same size close to each other.
5. Have interesting forms and areas and let each value or color lead through the composition in an interesting and pleasing manner.
6. Do not think too much about the center of interest, but more about the all-over pattern.
7. Carry out the atmosphere of the picture — rough and sharp, or smooth and calm.
8. Repetition of colors and shapes will give unity to a composition.
9. Be careful about how the corners of the picture are treated.
10. Have interesting proportions between adjoining forms or areas. A good proportion in design or pictorial composition is the ratio 2:3.

Good proportions apply to the dimension of the composition, as well as the forms or areas within the composition. One good method of cutting the canvas into pleasing areas is to let the main areas of the picture be in the relation of 1, 2, and 3 to each other, never allowing the numbers to run consecutively, but in similar relations to those shown in the divisions of the areas as shown at *A*, *B*, and *C* in Figure 1. The corresponding division or proportions for the main areas

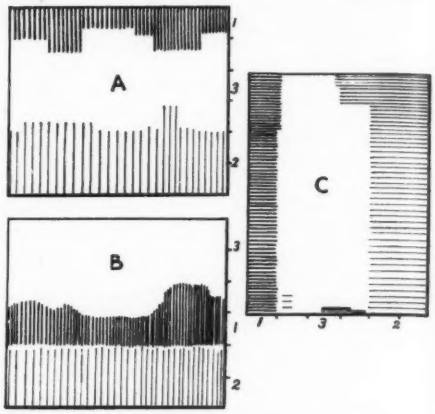


Fig. 1. Sketches showing experimental division of areas for pictorial compositions

of the three sketches are as follows: At *A*, 1:3:2 horizontal, at *B*, 3:1:2 horizontal, at *C*, 1:3:2 vertical.

After the main divisions have been sketched in a composition, the details of the picture may be added, but these basic proportions or divisions of the areas should never be lost by adding too many details, but should always be in evidence as they are the foundation of the design of the picture. With this brief introduction to pictorial composition it will be easier to make use of the composition finder. The construction of the finder is described in the following:

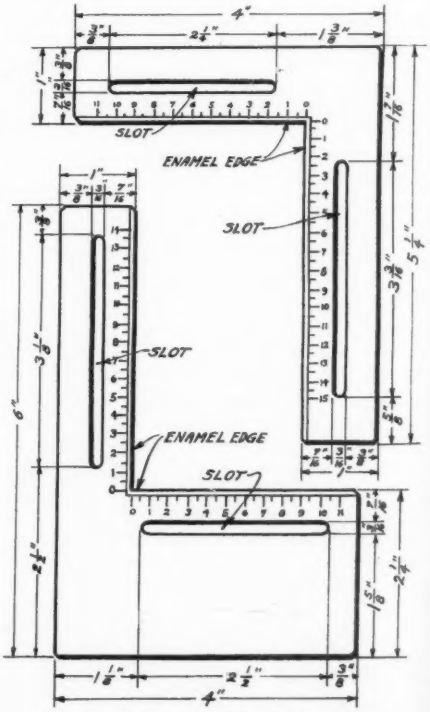


Fig. 2. Details for the construction of the composition finder

The two parts of the finder are cut from sheet brass with tin snips according to the dimensions given in Figure 2. Holes are first drilled at the ends of each slot and the slots are then cut out with a jeweler's saw. All raw edges should be smoothed down with a file,

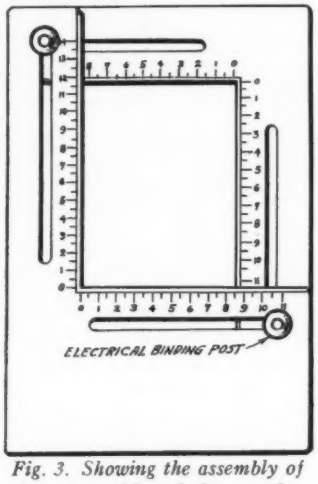


Fig. 3. Showing the assembly of the composition finder so that the size of the center opening can be varied and adjusted to suit the view

and the two pieces fastened together as shown in Figure 3 with two electrical binding posts. Numbers may be punched with number punches as shown to give the number of divisions, or if number punches are not available, equal divisions may be indicated along the edges by lines made with a chisel. This will necessitate counting the divisions each time. An edge may be made on the very inside edge of the finder with white enamel. When this is well dried, the main points in the sketch may be dotted on the enameled edge with a soft pencil, and the exact position found on the horizontal or vertical scales. After the sketch is complete, the dots may

Fig. 4. Showing use of composition finder

be rubbed off with a soft cloth. The use of the finder is shown in Figure 4. The finder is useful for not only finding a composition, but for determining the exact dimensions of a canvas necessary for a desired composition.

If the beginner has extreme difficulty in getting accurate proportions or positions in sketching, a drawing board may be arranged as shown in Figure 5 with horizontal and vertical scales corresponding to the horizontal and vertical scales of the finder. These may be made from two pieces of white cardboard and held to the drawing board over the sheet of drawing paper with thumb tacks as shown. Then the exact place where the main details viewed through the finder cut the edge of the finder are marked on the enameled edge, and the corresponding number on the horizontal or vertical scale observed. The relative location of the main details are then spotted in with pencil on the drawing paper as determined by the horizontal and vertical scales as shown in Figure 5. As an example, the tree shown in Figure 4, cuts the edge of the finder on the upper horizontal scale between 4 and 5, and the trunk ends at 3 on the vertical scale and 3 on the lower horizontal scale. These points are spotted in as shown in Figure 5, and the tree is accurately located. With this accurate location the remainder of the tree can be sketched in freehand, and thus almost a perfect reproduction of the picture viewed through the finder, may be made.

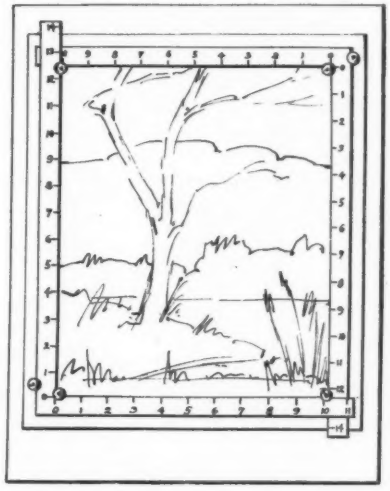


Fig. 5. Showing drawing board with horizontal and vertical scales similar to those on the finder. These strips are held in place on the drawing paper by thumbtacks as shown

MAKING LOOSE-LEAF RING NOTEBOOKS

Guy A. Pratt, Washington High School, East Chicago, Indiana

Notebooks may be purchased for as little as twenty cents, but, being covered with paper, they rarely last long before the hinge begins to break. When his notebook thus gives out, the pupil should salvage the ring metal it contains, for with it, and a few scraps of material and a few simple tools, he can easily make a new notebook which will compare favorably in appearance to the one bought originally and which will outlast it considerably.

The only tools required in making the new notebook consist of a bone folder, a knife, a rule, a leather punch, a rivet punch, and a hammer. It is usual to find all of these tools already on hand in the average general shop or art room. In place of the bone folder, a letter opener or a piece of hardwood shaped like a bone folder may be used.

As to the materials needed, the cover boards may be cut from window-display signs. Three pieces are required, one for each side, and a narrow strip for the back to which the ring metal is riveted. Imitation leather is the most practical medium with which to cover the boards, but if this cannot be obtained, heavy-weight cloth, such as chintz, may be used if of good quality. Lightweight canvas also can be used for this purpose. However, imitation leather may easily be procured from firms dealing in bookbinding supplies, at about 65 cents per yard. When chintz or canvas are used, they should be given a coating of clear varnish or clear lacquer which will waterproof them and prolong their wearing qualities. A strip of light canvas should be pasted over the backboard and the hinges on the inside of the cover to give added strength at these points. The inside of the boards should be lined with paper, either white or a color that harmonizes with the cover. A good quality of wrapping paper will do for this.

The front cover may be lettered and decorated to suit the individual requirements. Unless other means are available, these may be done on paper panels with India ink and then pasted in place on the cover. In case imitation leather is used, it can be tooled, after it is glued to the board, with regular leather-tooling instruments. The paste should be thoroughly dry, however, before tooling is attempted. The tools should be heated in order that the impressions will be lasting. Lettering and decorating may also be done with mounted imitation gold, and an electric pencil, or heated stylus. These accessories may be obtained from bookbinding supply firms.

Should it be desired to construct a number of notebooks for filing purposes, their backs should be titled for handy reference.

Hollow rivets with which to fasten the ring metals in place can usually be purchased at the local hardware store. The length and diameter of the rivets depend on the type of hole in the metal. Ring metals of the school-notebook variety usually contain two or three rings. The two-ring metal takes a standard sheet 8 by 10½ in. in size, while the three-ring metal takes an 8½ by 11-in. sheet. However, covers for other sizes of notebook paper may be made to the proper size by using a sheet of the paper as a guide. The edges of the boards should overhang the edges of the filler, when properly placed in the rings, by 3/16 to ¼ in. The distance between the cover boards must be in accordance with the outside diameter of the metal rings.

Instructions for Making

While the accompanying illustrations are more or less self-explanatory, there are a few points that should be emphasized if a good

and neat job is to result. These are mentioned in their proper sequence as follows:

1. Cut the boards so that the grain runs parallel to the hinges. The direction of the grain may be discovered by determining the direction in which the board bends more easily.

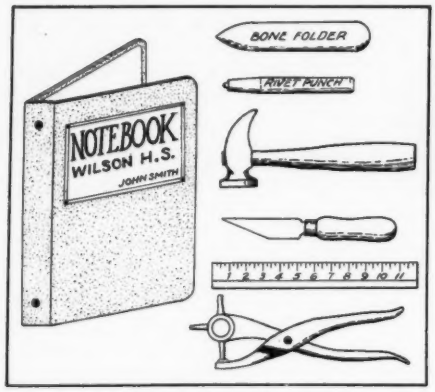


Fig. 1. The notebook and the tools used in constructing and binding it

2. Cut the covering material in one piece large enough to cover both boards and the back, allowing ¾-in. turn-in all around. See Figure 2.

3. Coat one side of one board with paste and place it in its right position on the cover stock; lay a rule or straightedge along its top edge, and lay the second board on with its top edge against this. Lay on the backboard strip, being sure to get it exactly centered and allow 3/16-in. space on each side for the hinge. In gluing or pasting, always spread the paste on the smaller of the two pieces being fastened together, and don't use too much paste, as a little well spread will stick better than if the coating is put on too thickly. Use plenty of newspaper beneath the work to keep it free of glue soiling. Turn the whole over and rub well with a clean cloth to remove all blisters.

4. Trim away a part of the corner as shown in Figure 2, and spread paste on the turn-in all around. Pull the turn-in over tightly with the finger tips and rub down securely. Next, tuck in the corners with the edge of the bone folder. The smaller the tucks, the neater the corner.

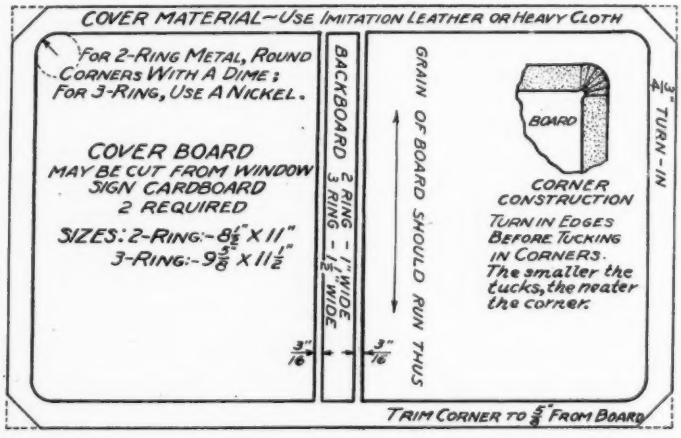

COVER MATERIAL—USE IMITATION LEATHER OR HEAVY CLOTH
FOR 2-RING METAL, ROUND CORNERS WITH A DIME; FOR 3-RING, USE A NICKEL.
COVER BOARD
MAY BE CUT FROM WINDOW SIGN CARDBOARD
2 REQUIRED
SIZES: 2-RING:- 8½" X 11"
3-RING:- 9⅝ X 11½"
BACKBOARD 2 RING - 1" WIDE 3 RING - 1½" WIDE
GRAIN OF BOARD SHOULD RUN THUS
BOARD
CORNER CONSTRUCTION
TURN IN EDGES BEFORE TUCKING IN CORNERS. The smaller the tucks, the neater the corner.
¾" TURN-IN
3/16"
3/16"
TRIM CORNER TO ⅝" FROM BOARD

Fig. 2. The binding material with the cover boards glued in position

5. Paste a 3-in. strip of lightweight canvas over the backboard and the hinges on the inside of the cover. Push it well down into the hinge grooves. See Figure 3.

6. Line the insides of the boards with paper.

7. Letter and decorate the top cover, and the back if desired.

Caution: If lettering is to be on the back of the notebook, be sure to mark the positions of the rivets before starting. Use the ring metal as a template for this so that the holes will be located accurately.

8. Punch the holes for the rivets in the back of the cover and rivet the metal in place.

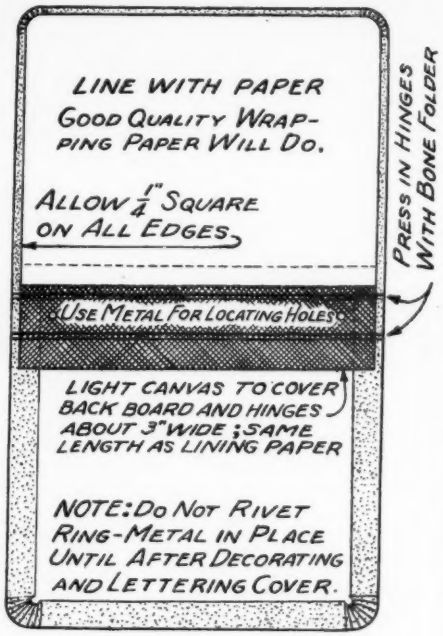

LINE WITH PAPER
GOOD QUALITY WRAPPING PAPER WILL DO.
ALLOW 1/4" SQUARE ON ALL EDGES
USE METAL FOR LOCATING HOLES
PRESS IN HINGES WITH BONE FOLDER
LIGHT CANVAS TO COVER BACK BOARD AND HINGES ABOUT 3" WIDE; SAME LENGTH AS LINING PAPER
NOTE: DO NOT RIVET RING-METAL IN PLACE UNTIL AFTER DECORATING AND LETTERING COVER.

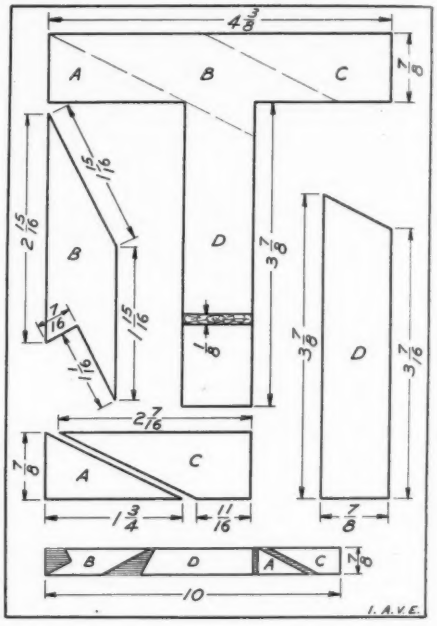
Fig. 3. The notebook with the turn-in pasted down, the corners tucked, the canvas-hinge strip pasted in, the holes punched, and one board lined

THE T PUZZLE

A. F. Starkey, High School, South Milwaukee, Wisconsin

The T puzzle shown herewith makes an interesting novelty which may be distributed when holding an open house or a shop exhibit.

To make these puzzles in quantities it is best to have the students cut them out on a production basis, using a band saw and a table saw. After all edges have been sanded off smoothly, they are separated into sets, after which the pieces are placed in an envelope, ready to be handed to the visitors.



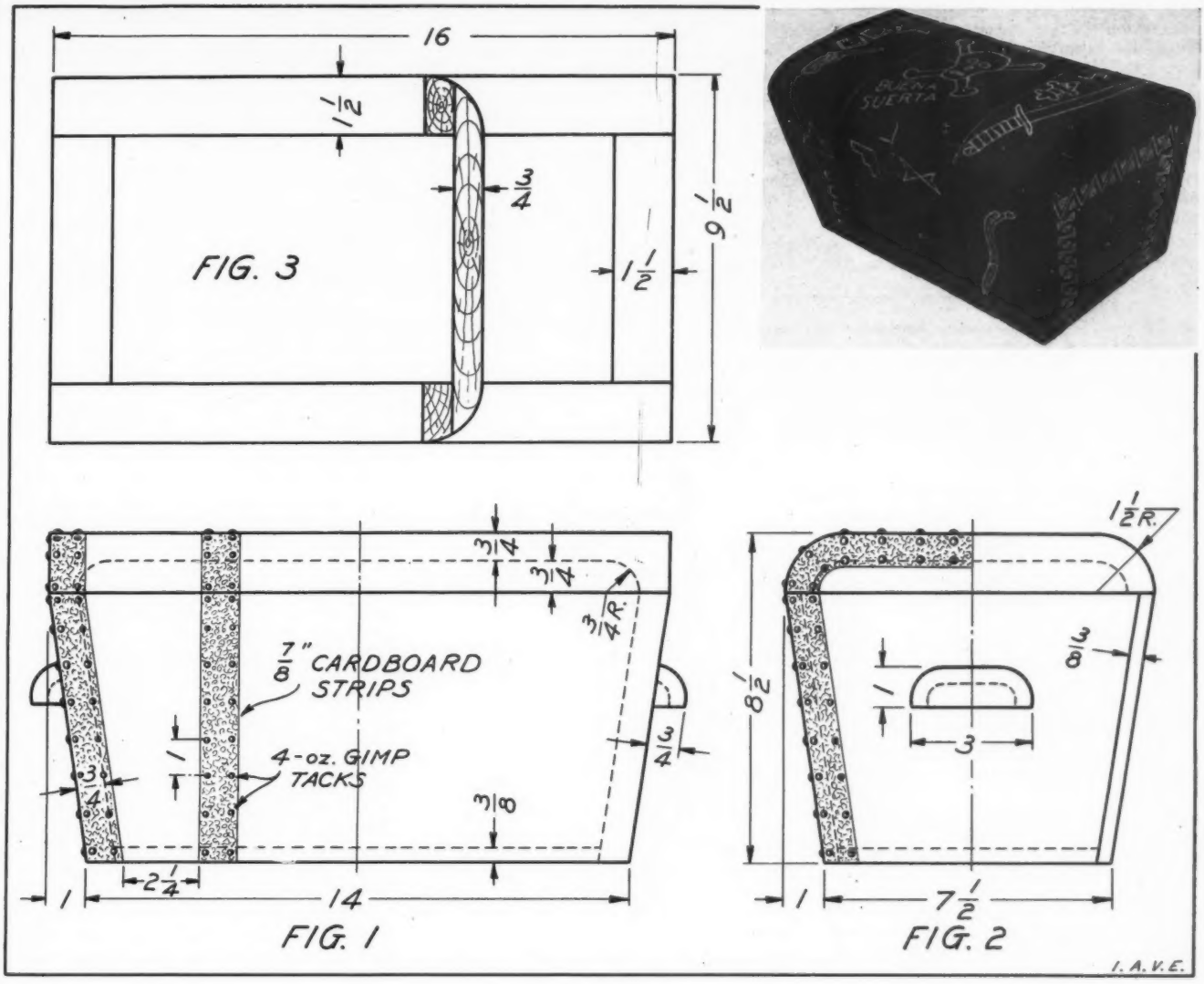
T Puzzle

TREASURE CHEST

Roy H. Earhart, Public Schools, Milwaukee, Wisconsin

Considered from the viewpoints of interest and teaching value, the chest described in this article has been found especially good for boys in the seventh and eighth grades. It works out equally well as an individual or as a class project. The pupils are especially interested in doing the simple carving on this chest. Without these, it would be just another box. The carving is all just outline work done with the 1/16-in. gouge, razor sharp, so that it will make a nice clean cut. All available space should be covered. The boy should be encouraged to find suitable designs and words during construction. These may take the form of old guns, knives, swords, spears, bows and arrows. He may also use good-luck signs such as the four-leaf clover, a horseshoe, or the sign of the north. Circles, squares, stars, and combinations of these also may be used, or the boy may choose foreign words or phrases, or some Indian signs, or geometric designs and borders. No chest would be complete without the old pirate stand-by — the skull and crossbones. And last but not least, the boy must carve his name.

Figures 1, 2, and 3 give the construction details. Any kind of soft wood may be used.



Treasure Chest

Assemble the chest, and make the top by using a ¾-in. board to fit the box and gluing ¾ by 1½-in. strips to it as shown in Figure 3. Round off the front and back of the top as shown in Figure 1. Round off the inside of the top. See Figures 1 and 2. Next fit the lid to the box. Make the handles and fasten them on the chest with f.h.b. screws driven from the inside. Sandpaper all the parts. Use ¾-in. brass butterfly surface hinges, brass hasp and a small dog-collar lock. Stain the chest a light brown and fill with a light coat of shellac.

The *iron bands* are made of heavy cardboard strips. Cut them out a little long, sandpaper the edges and stain. The stain for these is made by mixing one part of black paint with two parts of turpentine. Wipe it off and it will give the effect of old iron. Let the stain dry, then tack them onto the chest.

The next step is to put on the carving. Draw the designs on the chest with a soft-lead drawing pencil. Some may be drawn freehand, but a pattern will have to be made for others. Draw and carve a few at a time.

To finish, use another coat of shellac and wax, or a coat of varnish and wax.

The chest may be made larger or smaller for special purposes.

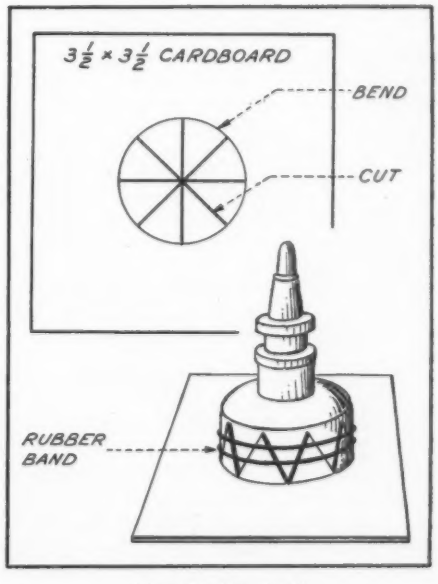
DRAWING-INK STAND

Francis V. Dvorak, Herman Ridder Junior High School, New York City

The accompanying illustration shows a very simply constructed stand. The piece of cardboard is 3½ by 3½ in.

Lay out a circle in the center of this square, ⅛ in. larger in diameter than the diameter of the bottle. Divide the circle into eight equal parts. With a sharp knife cut along the radial lines and fold back the triangular flaps as indicated in the sketch. Place the hole in the base over the neck of the bottle, and press the base down until it is even with the bottom of the bottle. Then place a rubber band over the flaps to keep the bottle from slipping out.

With this enlarged base, it will be practically impossible to knock the bottle over. To secure it more firmly, fasten the base to the drawing board with a few thumb tacks.



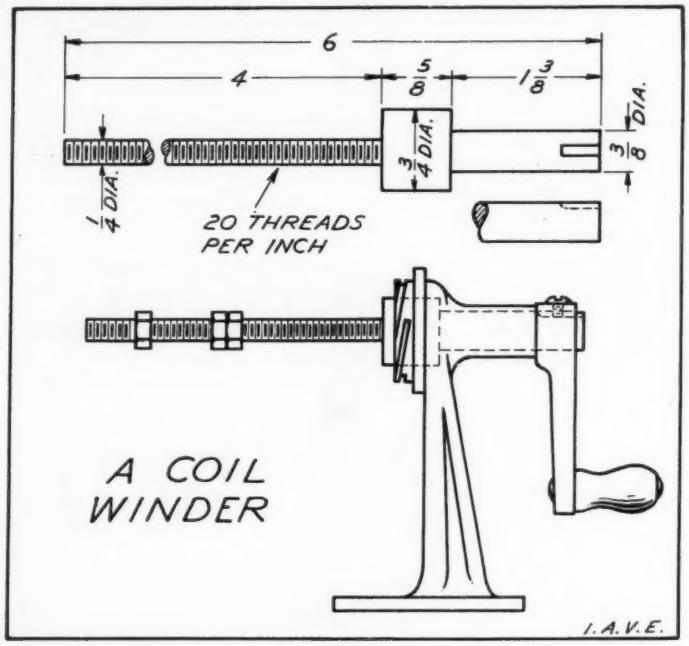
Drawing-ink stand

A COMPACT COIL WINDER

Hugo L. Sutor, Chas. Sumner Junior High School, New York City

The coil winder described herewith was constructed from an old pencil sharpener. It is especially useful in the electric shop because it is a neat, compact, and durable device which may be stored away easily in a locker or cabinets when it is not in use.

The conversion is rather simple. Remove the old dull knives together with the shaft upon which they are mounted. Calculate the



over-all length of the stock required, taking into consideration the length of shaft extending through the standard for handle; the amount of shoulder required so that the revolving work will clear the face of the stand; and the desired length of the threaded winding rod. It might be well to make it long enough to take care of any eventualities. The diameter of the shaft is readily obtained from the old one. But care must be observed in measuring for the diameter of the shoulder for it must be small enough to seat properly against the inner part of the standard so that the handle may be screwed on tightly and the unit revolved freely. The winding portion of the mandrel may be threaded ¼ in. or 5/16 in. as needed. A keyway in the shaft for the locking screw of the handle will be a wise precaution. When assembled, two wood screws will secure the winder firmly to a wooden base which may be portable or fixed.

MECHANICAL-DRAWING BENCHES

Herbert K. Iverson, Auburn, Washington

The drawing benches and stools presented herewith are not intended to be constructed as a class project unless the class is sufficiently advanced to undertake the work. They are presented, however, because they furnish an interesting and instructive production job.

In the junior high school in Washington, all grades receive drawing along with their shopwork. There is only one room large enough to accommodate the assigned number of students in our school. Since the size of the room limits the work space allotted to each bench, a drawing of the room was made and the equipment, drawn to scale, was moved about until a desirable arrangement was secured.

The decision to make double benches was reached because they conserved space and could be made cheaper than single benches. Black iron pipe in 20-ft. lengths was then ordered.

Method of Procedure

1. Make a full-sized layout of the bench and stool on the floor or some other suitable place.
2. Determine the exact length of the standards from this layout.
3. Cut the ¾-in. pipe into proper lengths for the uprights *B* and the crosspieces *C*.

NOTE: Utilize all of the threads; that is, be sure that they are on the pieces that will later be the uprights.

4. Bend a sample piece to determine the amount that the bend will take up.
5. When this amount has been determined, then it is possible to bend the pattern.
6. Bend the pattern to the full-size drawing.

NOTE: The jig used by plumbers to bend pipe makes an excellent bending device.

7. Bend the remainder of the standards to the pattern.
8. Pair up the standards as near as possible then cut off the ends until both parts of each pair are of the same height.
9. Thread the ends of the standards and screw on the pipe caps as shown at *D* in the illustration.
10. Put these standards aside for the time being.
11. Cut the 1-in. pipe for the footrests into the proper lengths as is indicated at *H* in the illustration.
12. Cut into the proper lengths enough of the ½-in. pipe to make the braces for the benches as shown at *A* in the illustration.
13. Next heat the ½-in. crosspieces at the center, and squeeze this part together in a vise, bending it at the same time to fit the pattern previously laid out. See *G* in the illustration.
14. Drill the necessary holes in each standard and brace.
15. The benches are then ready to be assembled. The ends to be welded, should be ground to shape so that good welded joints may be obtained.

NOTE: A jig for assembling must be built in order to hold the parts in the proper relation to each other.

16. After all of the standards have been welded into complete units, the table tops should be secured in place.

NOTE: Be sure that the brace *G* is plumb.

17. Paint the pipe with black enamel and the top with one coat of orange shellac and two coats of varnish.

The Stools

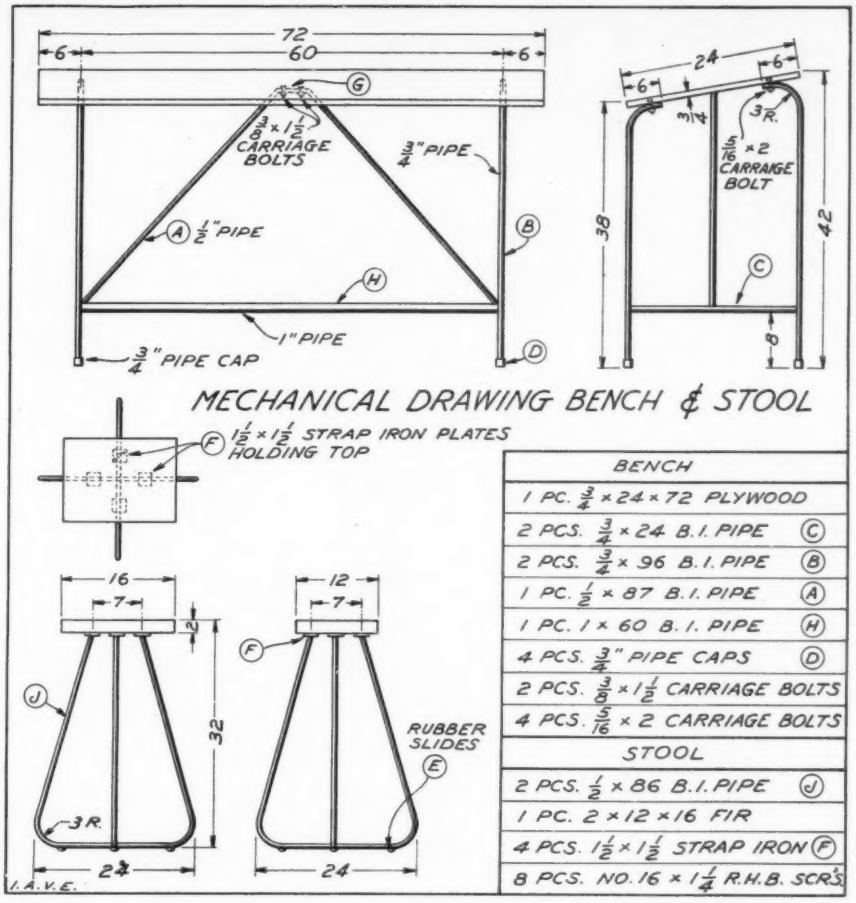
When building the stools, it was first thought best to fasten the iron standards to the bench top with regular pipe flanges, but here again cost precludes their use. The method used while not as neat was equally serviceable and certainly cheaper. A piece of strap iron 1½ in. wide and as long as necessary was purchased and from this were made the fastening devices as shown at *F* in the drawing.

1. Lay out the piece of strap iron into squares.
2. In the center of each of these squares drill a hole large enough to accommodate the end of a ½-in. pipe.
3. In the opposite corners of the squares drill a ¼-in. hole, these to be used for the screws which fasten the top in place.
4. After all the holes are drilled, cut up the strap iron into the squares already laid out.
5. Lay these pieces aside for the time being.
6. Cut the remaining ½-in. pipe into the proper lengths for the stool as shown at *J* in the illustration.
7. Bend a sample piece to determine the amount the bend will take.
8. When this amount has been determined, then it is possible to bend the pattern.
9. Bend the pattern to the full-sized drawing.
10. Bend the remainder of the standards to the pattern.
11. Cut off the uneven ends of the standards until they are all the same length.
12. Weld on the fastening pieces already made as shown at *F* in the illustration.

NOTE: It is necessary to make a jig so that all the standards will be of the same length after welding on the fastening pieces.

13. Cut one half of the standards in half.
14. Grind the ends of the cut standards for a better fit when welding.
15. Set up a suitable welding table on which the stools will be assembled and welded.

NOTE: While the weld is still hot, it will


MECHANICAL DRAWING BENCH & STOOL
BENCH
1 PC. 3/4 × 24 × 72 PLYWOOD
2 PCS. 3/4 × 24 B.I. PIPE (C)
2 PCS. 3/4 × 96 B.I. PIPE (B)
1 PC. 1/2 × 87 B.I. PIPE (A)
1 PC. 1 × 60 B.I. PIPE (H)
4 PCS. 3/4" PIPE CAPS (D)
2 PCS. 3/8 × 1 1/2 CARRIAGE BOLTS
4 PCS. 5/16 × 2 CARRIAGE BOLTS
STOOL
2 PCS. 1/2 × 86 B.I. PIPE (J)
1 PC. 2 × 12 × 16 FIR
4 PCS. 1 1/2 × 1 1/2 STRAP IRON (F)
8 PCS. NO. 16 × 1 1/4 R.H.B. SCRS.
3/4" PIPE CAP
1" PIPE
1/2" PIPE
3/4" PIPE
3/8 × 1 1/2 CARRIAGE BOLTS
5/16 × 2 CARRIAGE BOLT
1 1/2 × 1 1/2 STRAP IRON PLATES HOLDING TOP
RUBBER SLIDES
I.A.V.E.

be well to try the stool on a flat surface to see that it stands firmly.

16. After the welds have cooled, brush off the stools and apply a coat of black enamel.
17. Next prepare the tops of the stools.
18. Assemble the stools.
19. Drill holes and fasten on the rubber slides as shown at *E* in the illustration.
20. Stain and varnish the tops.

This equipment has proved itself practical and serviceable in the everyday requirements of the drawing room. The janitor finds little difficulty when sweeping around them, they are easy to move and easy to keep clean.

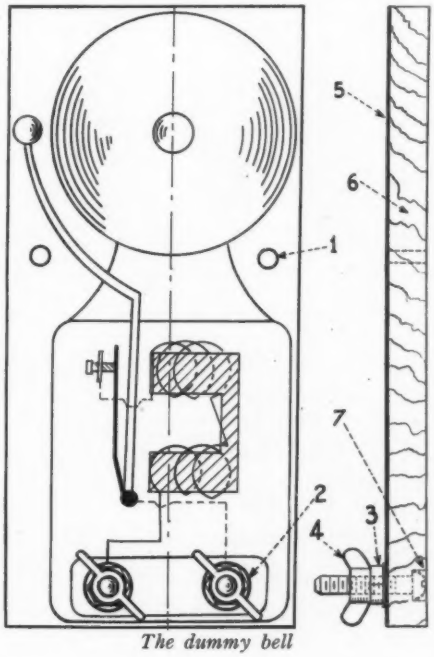
DUMMY BELL FOR THE ELECTRIC SHOP

S. James Senes, Joliet Township High School, Joliet, Illinois

Instructors of electrical work will doubtless agree that the ordinary vibrating bell, such as used in the teaching of bell-wiring circuits, has a limited life in the school shop. Students invariably remove the covers to see what makes the bell operate. This practice leads to damage of the mechanism and necessitates repair or replacement.

While bolting or soldering the covers, onto the frames of bells, can be resorted to, this presents another difficulty. With covers bolted or soldered in place, the student cannot trace the circuit or note the internal connections; hence, he is unable to give a step-by-step explanation of its operation.

The writer has for several years made use of what is termed a "dummy" bell and this has proven to be an economical and effective teaching device. A full-size tracing was prepared showing the complete circuit of an ordinary 2½-in. vibrating bell. From this, blueprints were made and glued to a 7/16 by 3 by 6¼-in. wooden block. The four holes, numbered 1 and 2, are drilled through the block for the terminals, and for fastening the dummy bell to a panel or the wall. No. 10-24 by 1½-in. machine screws are used with a washer and hexagonal nut for holding each screw firmly in place, while a wing nut placed over the hexagonal nut facilitates the connection of wires to the dummy bell. These are numbered 3, 4, and 7, in the illustration.



The dummy bell

The cost of making these dummy bells is very small and they overcome the difficulties previously mentioned. Understanding the circuit is made easy since the internal connections are clearly shown. This device can be used alone or with a regular vibrating bell or buzzer on jobs requiring the use of more than one bell. A substantial saving in replacements and more effective teaching will result. A coat of clear shellac applied to the blueprint will preserve it better.

TURNINGS FROM DISCARDED BOWLING PINS

Leslie J. Miller, Ardmore Junior High School, Villa Park, Illinois

Woodworking instructors will find that bowling pins which can no longer be used in the bowling alley, contain some very good material for wood turning. The main part of the pin is over 7 in. long and 4½ in. in its largest diameter. Boxes, vases, candlesticks, lamps, and numerous smaller articles can be turned from this material. Try this material once and you will be watching the bowling alleys regularly for their discarded sets of pins.

TRANSPARENTIZING FORMULAS

Shop teachers who want to make blueprints of drawings inked on heavy paper may find the following transparentizing formulas useful.

Mr. Harvey W. Waffle, High School, Waukesha, Wis., submits the following: 4 oz. banana oil, one 10-cent tube white vaseline. Mix the two by heating slightly. Keep in stoppered bottle. The banana oil furnishes a quick drier, and the vaseline the permanent oil. Oil side of paper turned toward the light.

Mr. Joseph Munce, Highland Park, N. J., has this to suggest: 10 per cent Canada balsam and 90 per cent Benzol. This solution is rubbed on the back of the sheet, and dries out.

WOODLAND INDIAN BAG WEAVING

W. Ben. Hunt, Hales Corners, Wisconsin

This simple method of weaving can be used by children as young as seven years, with very pleasing results. The simplicity of the loom is another favorable factor. As to the material, almost any heavy cord will do for the warp, as it will be completely covered with the weft, anyway. If no heavy wool is obtainable, two, three, or even four strands of thinner wool can be used as one strand. This will not show up in the finished work.

Some people like to do this sort of weaving on their laps. For these, the loom shown in the sketch will be more acceptable. The edges of the frame should be sanded very carefully and a coat or two of shellac put on so the work can be easily shifted about.

This bag-weaving method is almost a lost art among the Indians of today, not much of it having been done in the past thirty years.

It is an interesting system of weaving, however, and very artistic things can be produced by means of it.

THE MORTISE-AND-TENON JOINT — XI

John E. Doren, High School, Eureka, California

(Continued from page 405, November, 1938)

The Mortise-and-Tenon Joint on Rabbeted Stock

Case I. Stock Rabbeted on One Edge ± 1/3 of Its Thickness

Joints of this variety (see Fig. 88) are quite common in sash and similar frames where the ends of the stiles finish flush with the edges of the rails. To conceal the edges

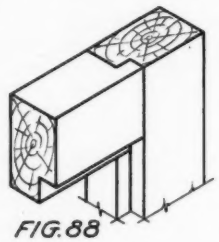
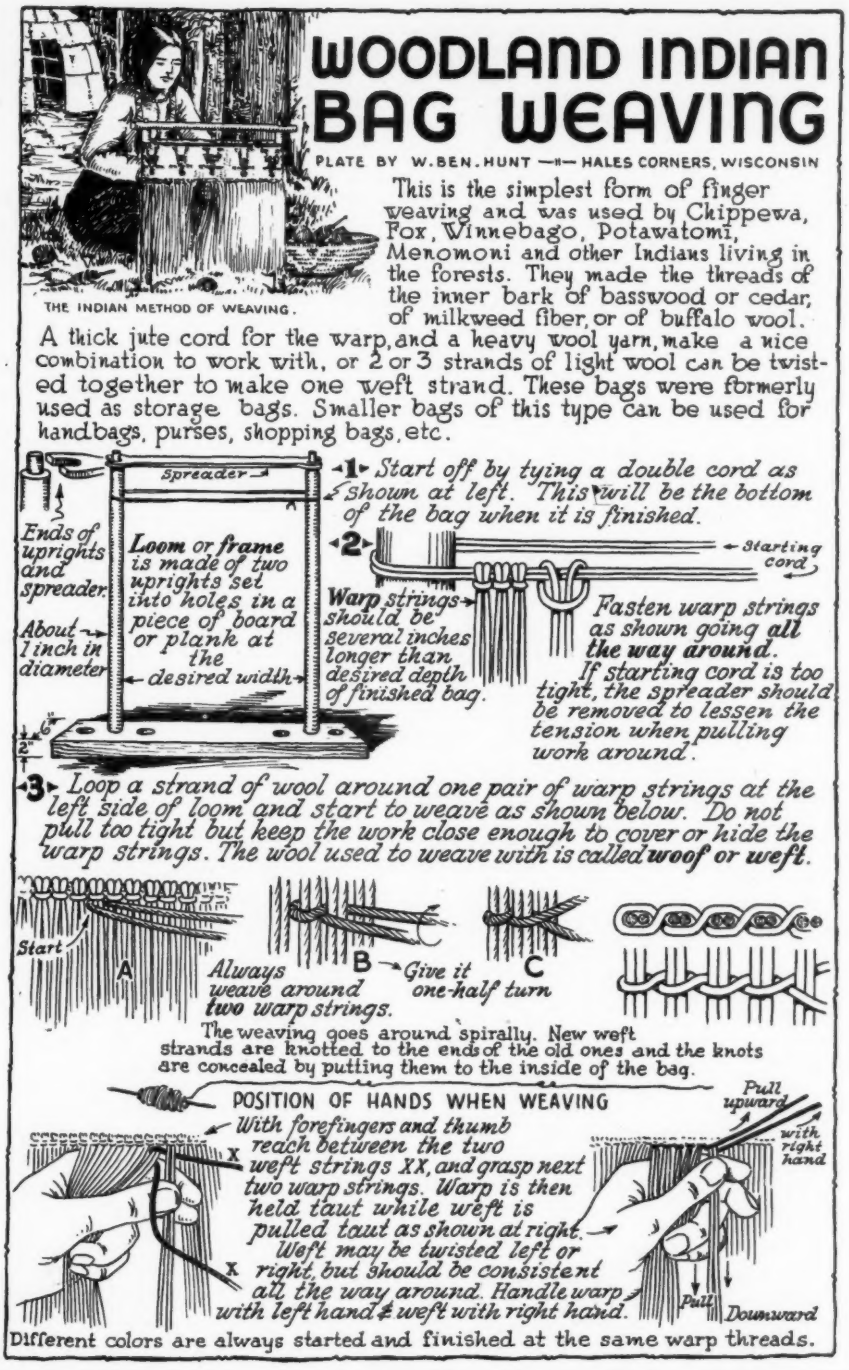


FIG. 88

of the tenons, it is necessary to relish them. To make the rail ends fit against the edges of the stiles, it is necessary to provide offset shoulders and recesses in the rails. This may seem rather complicated, but in reality this joint is rather simple if due consideration is given to the placing of the tenon with regard to the rabbet.

Study Figure 89. One cheek of the tenon should be made in line with one face of the rabbet; if this is done, a strong, well-fitted joint may be made with a minimum of labor. This figure shows a wise relationship between the tenon cheek on one face of the rabbet. Here the stock is shown rabbeted before the tenon is laid out and cut, but in the most common practice, the tenon is cut before the stock is rabbeted, but in either case, the same relationship of tenon to rabbet should be maintained.

Suggestion. Until one is quite familiar with the laying out of tenons for this variety of joint, it is good practice to rabbet a piece of


WOODLAND INDIAN BAG WEAVING
PLATE BY W. BEN. HUNT — II — HALES CORNERS, WISCONSIN
THE INDIAN METHOD OF WEAVING.
This is the simplest form of finger weaving and was used by Chippewa, Fox, Winnebago, Potawatomi, Menomoni and other Indians living in the forests. They made the threads of the inner bark of basswood or cedar, of milkweed fiber, or of buffalo wool. A thick jute cord for the warp, and a heavy wool yarn, make a nice combination to work with, or 2 or 3 strands of light wool can be twisted together to make one weft strand. These bags were formerly used as storage bags. Smaller bags of this type can be used for handbags, purses, shopping bags, etc.
Spreader
Ends of uprights and spreader
Loom or frame is made of two uprights set into holes in a piece of board or plank at the desired width
About 1 inch in diameter
1 Start off by tying a double cord as shown at left. This will be the bottom of the bag when it is finished.
2
Starting cord
Warp strings should be several inches longer than desired depth of finished bag.
Fasten warp strings as shown going all the way around. If starting cord is too tight, the spreader should be removed to lessen the tension when pulling work around.
3 Loop a strand of wool around one pair of warp strings at the left side of loom and start to weave as shown below. Do not pull too tight but keep the work close enough to cover or hide the warp strings. The wool used to weave with is called woof or weft.
Start
A
Always weave around two warp strings.
B
Give it one-half turn
C
The weaving goes around spirally. New weft strands are knotted to the ends of the old ones and the knots are concealed by putting them to the inside of the bag.
POSITION OF HANDS WHEN WEAVING
With forefingers and thumb reach between the two weft strings XX, and grasp next two warp strings. Warp is then held taut while weft is pulled taut as shown at right. Weft may be twisted left or right, but should be consistent all the way around. Handle warp with left hand & weft with right hand.
Pull upward with right hand
Pull Downward
Different colors are always started and finished at the same warp threads.

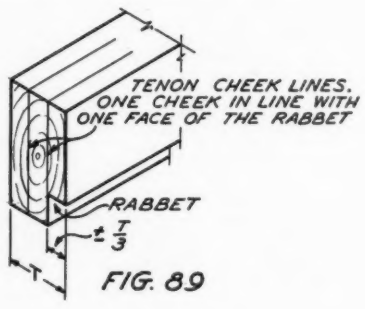


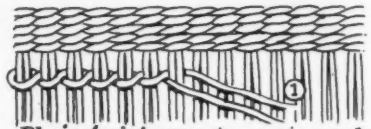
FIG. 89

the material before proceeding to lay out the tenon cheeks and shoulders.

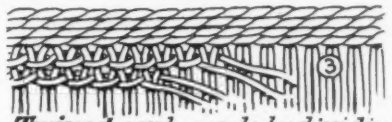
Because of the rabbet in the stile, the tenon shoulders will not be opposite each other but will be offset a distance equal to the width of the rabbet as shown in Figure 90. *Note:* the width of the rabbet is measured in the same direction as the width of the stock.

When it is desirable or necessary that the edge of the rail shall finish flush with the end of the stile without exposing the tenon, the tenon must be relished and the end of the rail recessed to fit against the edge of the

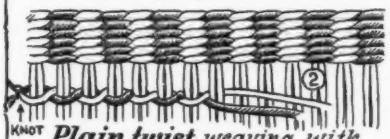
PROCESSES, PATTERNS, AND COLOR IN WOODLAND INDIAN WEAVING



Plain twist *weaving, using only one color of weft.*



Twined *work, made by dividing the warp strings at each round of weaving.*



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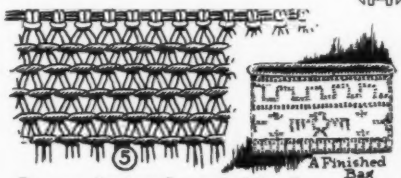
Plain twist *weaving with two colors of weft.*

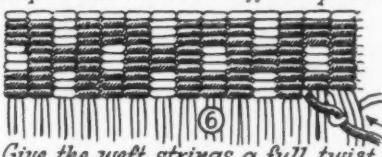
Twined *work with two colors of weft.*

Top view showing how ***concealed twist*** *is woven. This process makes it possible to weave different patterns*



A Finished Bag

Loose twined *work like this may be made by using fishnet cord for both warp and weft. Different colors may be used but no designs are used.*



Give the weft strings a full twist when concealing one color and only a half twist when alternating.

DATA FOR THIS PLATE FURNISHED BY MR. W. C. McKERN, MILWAUKEE PUBLIC MUSEUM

A variety of patterns can be worked out by using the methods shown above. A bag can be made up of a series of different colored bands or of wide bands, each worked out with different patterns and colors. The twist can also be reversed for variety.

4 *The beginning of the bag is the bottom of the finished bag, and sewing it up is the last operation.*

To finish the top of the bag, take it off the frame and put it back upside-down. The loose ends of warp are then sort of rolled into a rope and wrapped by sewing (Fig. 1 at right), or with a closely sewed button hole stitch Fig. 2. Often the edge is bound with a strip of colored cloth. Fig. 3.

5 *If a zipper is to be sewed onto the opening, the ends may simply be finished by knotting one warp string of one pair to one of the next, etc., going completely around twice. Sew zipper to this edge.*

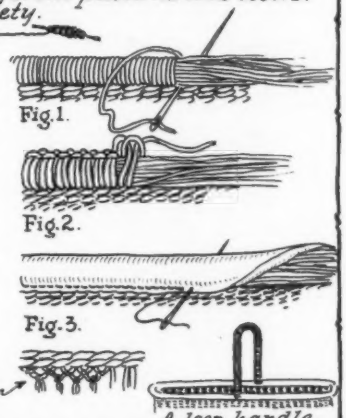


Fig. 1.

Fig. 2.

Fig. 3.

A loop handle.

A few simple patterns for repeat borders and the method of laying them out

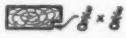
stile. The mortise in the stile must be placed a distance from the end equal to at least the amount of relish taken from the tenon. Study Figure 91. It is good practice to cut the stile 1 in. longer than the finished dimensions and place the mortise accordingly a distance from the end equal to the amount of relish plus ½ in.

The length of the tenon in this case is measured from the end of the tenon to the nearest shoulder. See Figure 92. This is done to avoid the spoiling of stock in case of a misunderstanding, or an error in the marking of the tenon shoulders.

When entering the notes on a cutting bill, this variety of tenon should be specified "Relished and Recessed — Shoulders offset 1 in. See detail."

Example: Study Figure 93, a sash frame with plain rabbeted rails.

Top rail — 1 piece 1 by 2⅜ in. by 2 ft. 5 in., tenoned two ends, ⅜ by 1¾ by 1½ in., relished and recessed. Shoulders offset ⅜ in.



Bottom rail — 1 piece 1 by 3½ in. by 2 ft. 5 in., tenoned two ends ⅜ by 2⅞ by 1½ in., relished and recessed. Shoulders offset ⅜ in. Rail rabbeted ⅜ by ⅜ in.

Often, instead of specifying the detail of the rabbet, a sketch is made showing a section of the rail either full size or with the size of the rabbet marked.

To Relish and Recess a Tenon

First Method — with Hand Tools

1. Rip along the relish line with a fine-tooth ripsaw. (a fine-tooth saw will splinter less than a saw with coarse teeth), and positively stop the ripping at the shoulder nearest the end of the tenon, as shown in Figure 94.

2. Cut out the recess by boring to the required depth with a bit slightly smaller than the thickness of the tenon. See Figure 95.

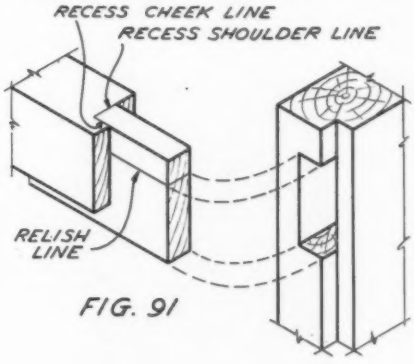


FIG. 91

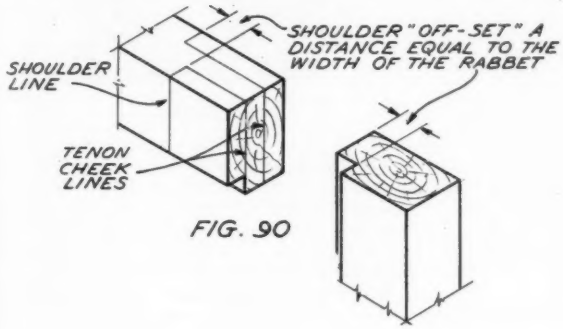
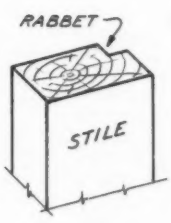


FIG. 90



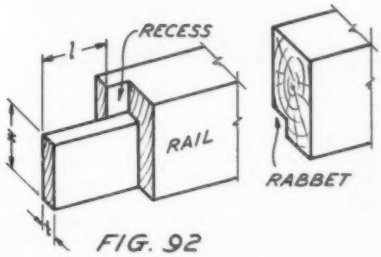


FIG. 92

3. Finish cutting the recess with a sharp chisel and leave both shoulder and cheek clean and free of chips or splinters. See Figure 96.

Second Method

1. Rip along relish line as in the first method, then saw a relish shoulder in line with the regular tenon shoulder nearest to the end of the tenon as shown in Figure 97.

2. Finish cutting the relish recess with a sharp chisel as indicated in Figure 98, using a series of light cuts.

Third Method (Machine method)

1. Rip along relish line as in the first and second methods.

2. If a hollow chisel mortiser is available, the recess may be quickly and accurately cut at one stroke by using a chisel the same in size as the thickness of the tenon. See Figure 99.

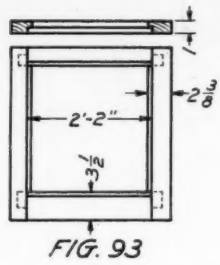


FIG. 93

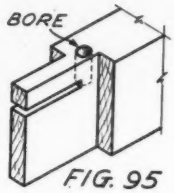


FIG. 95

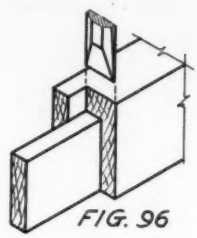


FIG. 96

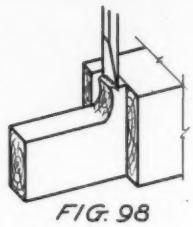


FIG. 98

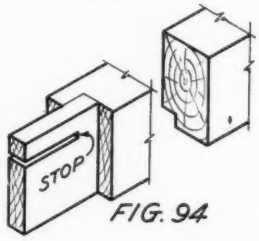


FIG. 94

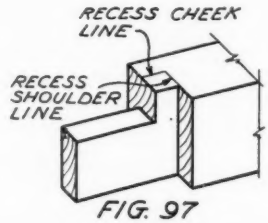


FIG. 97

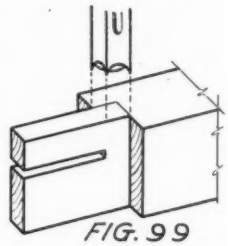


FIG. 99

Personal News

DR. LEE GOES TO COLUMBIA

Edwin A. Lee, Ph.D., former director of the National Occupational Conference, has been appointed Professor of Education and Head of the Department of Vocational Education, Teachers College, Columbia University, New York City.

Dr. Lee occupied the position of director of the National Occupational Conference since 1936.

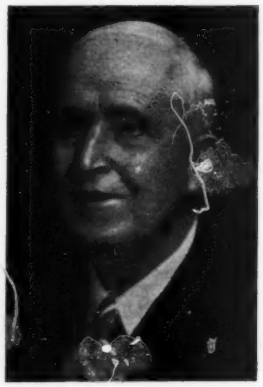
From 1933 to 1936, he was the Superintendent of Schools at San Francisco, Calif. He had previously held the position of Professor of Education and Director of the Division of Vocational Education at the University of California, Berkeley, Calif., from 1921–1933. From 1917 to 1921, he was a Professor of Education at the Indiana University. From 1916 to 1917 he was an Associate Professor of Vocational Education, Carnegie Institute of Technology, Pittsburgh, Pa.

He was the first president of the American Vocational Association, and is at present chairman of Subcommittee on Vocational Education of the White House Conference on Child Health and Protection, a member of the Technical Advisory Committee of the United States Employment Service, a member of the WPA Education Program. He is a member of the editorial board of *Occupations,* and is the author of *Objectives and Problems of Vocational Education.*

Edwin A. Lee

K. G. SMITH RETIRES

K. G. Smith, State Supervisor Trade and Industrial Education for Michigan since 1920, will retire December 1, 1938, because of failing health. Mr. Smith graduated from the University of Chicago with the degree of B.A. in 1896. He received the degree of B.S. in mechanical engineering from the University of Illinois in 1905. He also pursued graduate work at Harvard University in 1910, and received the degree of M.E. from the University of Illinois in 1915.


Kenneth G. Smith

He served for several years as teacher of science, mathematics, and history in the Steimann Institute, Dixon, Ill., and later accepted a position on the faculty of the Pontiac Township High School where he taught two years. From 1903–08, he held various responsible positions in the field of engineering.

In 1908, he was appointed assistant professor in mechanical engineering and traveling expert for the engineering experiment station of the University of Illinois. From November, 1909, to August, 1913, he held the position of associate professor of mechanical engineering and district representative of the University Extension Division of the University of Wisconsin. Then followed four years as director of engineering extension at Iowa State College, Ames, Iowa. From here he entered the services of the Federal Government as special agent of the board of vocational education, on emergency war courses and teacher training.

With the cessation of the special educational work made necessary by our entry into the world war, he returned to the Iowa State College as professor of trade and industry and director of industrial teacher training in September, 1919. In September, 1920 he received his appointment as state supervisor of industrial education in Michigan. This position he held until the present time.

Mr. Smith is a life member of the American Vocational Association, and of the Michigan Industrial Education Society. He also is a member of the National Educational Association and the Michigan Education Association. He has held responsible positions in a number of these educational organizations.

He is the author of numerous books and pamphlets on industrial education and has contributed extensively to the professional literature of his field.

FRANK W. DALTON SUCCEEDS K. G. SMITH

Mr. Frank W. Dalton, now the Acting Chief, Trade and Industrial Education Division, will succeed Mr. K. G. Smith as Supervisor of Trade and Industrial Education in Michigan.

Frank W. Dalton

Mr. Dalton is a native of Michigan. He was graduated from the Central State Teachers' College in 1914. He received an A.B. degree from this institution in 1923. In 1933 he received an M.A. degree, and in 1937 a Ph.D. degree from the University of Michigan.

Following his graduation, he was a county

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3. Finish cutting the recess with a sharp chisel and leave both shoulder and cheek clean and free of chips or splinters. See Figure 96.

Second Method

1. Rip along relish line as in the first method, then saw a relish shoulder in line with the regular tenon shoulder nearest to the end of the tenon as shown in Figure 97.

2. Finish cutting the relish recess with a sharp chisel as indicated in Figure 98, using a series of light cuts.

Third Method (Machine method)

1. Rip along relish line as in the first and second methods.

2. If a hollow chisel mortiser is available, the recess may be quickly and accurately cut at one stroke by using a chisel the same in size as the thickness of the tenon. See Figure 99.

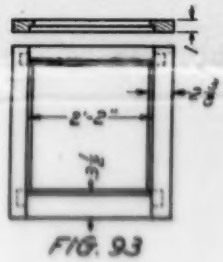


FIG. 93

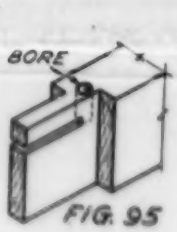


FIG. 95

FIG. 96

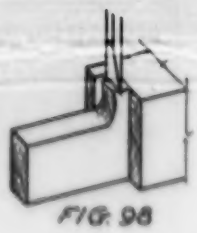


FIG. 98

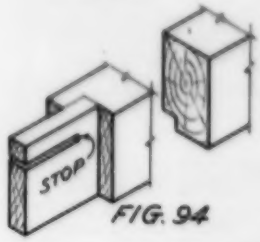


FIG. 94

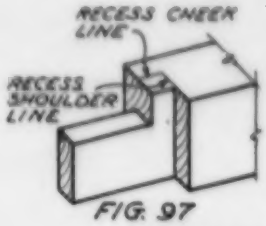


FIG. 97

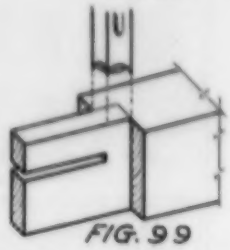


FIG. 99

Personal News

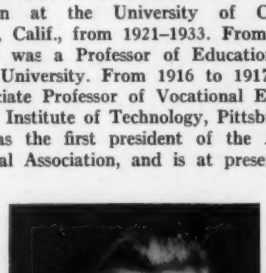
DR. LEE GOES TO COLUMBIA

Edwin A. Lee, Ph.D., former director of the National Occupational Conference, has been appointed Professor of Education and Head of the Department of Vocational Education, Teachers College, Columbia University, New York City.

Dr. Lee occupied the position of director of the National Occupational Conference since 1936.

From 1933 to 1936, he was the Superintendent of Schools at San Francisco, Calif. He had previously held the position of Professor of Education and Director of the Division of Vocational Education at the University of California, Berkeley, Calif., from 1921–1933. From 1917 to 1921, he was a Professor of Education at the Indiana University. From 1916 to 1917 he was an Associate Professor of Vocational Education, Carnegie Institute of Technology, Pittsburgh, Pa.

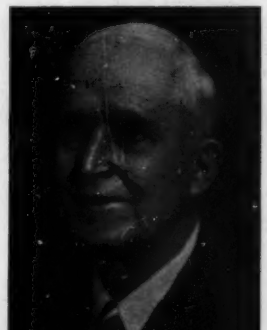
He was the first president of the American Vocational Association, and is at present chairman of Subcommittee on Vocational Education of the White House Conference on Child Health and Protection, a member of the Technical Advisory Committee of the United States Employment Service, a member of the WPA Education Program. He is a member of the editorial board of *Occupations*, and is the author of *Objectives and Problems of Vocational Education*.



Edwin A. Lee

K. G. SMITH RETIRES

K. G. Smith, State Supervisor Trade and Industrial Education for Michigan since 1920, will retire December 1, 1938, because of failing health. Mr. Smith graduated from the University of Chicago with the degree of B.A. in 1896. He received the degree of B.S. in mechanical engineering from the University of Illinois in 1905. He also pursued graduate work at Harvard University in 1910, and received the degree of M.E. from the University of Illinois in 1915.



Kenneth G. Smith

He served for several years as teacher of science, mathematics, and history in the Steimann Institute, Dixon, Ill., and later accepted a position on the faculty of the Pontiac Township High School where he taught two years. From 1903–08, he held various responsible positions in the field of engineering.

In 1908, he was appointed assistant professor in mechanical engineering and traveling expert for the engineering experiment station of the University of Illinois. From November, 1909, to August, 1913, he held the position of associate professor of mechanical engineering and district representative of the University Extension Division of the University of Wisconsin. Then followed four years as director of engineering extension at Iowa State College, Ames, Iowa. From here he entered the services of the Federal Government as special agent of the board of vocational education, on emergency war courses and teacher training.

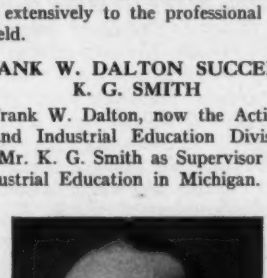
With the cessation of the special educational work made necessary by our entry into the world war, he returned to the Iowa State College as professor of trade and industry and director of industrial teacher training in September, 1919. In September, 1920, he received his appointment as state supervisor of industrial education in Michigan. This position he held until the present time.

Mr. Smith is a life member of the American Vocational Association, and of the Michigan Industrial Education Society. He also is a member of the National Educational Association and the Michigan Education Association. He has held responsible positions in a number of these educational organizations.

He is the author of numerous books and pamphlets on industrial education and has contributed extensively to the professional literature of his field.

FRANK W. DALTON SUCCEEDS K. G. SMITH

Mr. Frank W. Dalton, now the Acting Chief, Trade and Industrial Education Division, will succeed Mr. K. G. Smith as Supervisor of Trade and Industrial Education in Michigan.



Frank W. Dalton

Mr. Dalton is a native of Michigan. He was graduated from the Central State Teachers' College in 1914. He received an A.B. degree from this institution in 1923. In 1933 he received an M.A. degree, and in 1937 a Ph.D. degree from the University of Michigan.

Following his graduation, he was a county

(Continued on page 17A)

SCHOOL LAYOUTS BY ATF

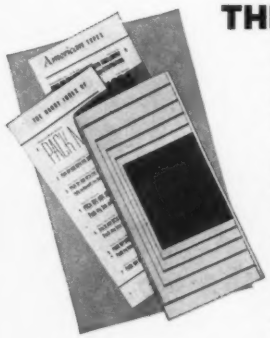
WHY TEACH PRINTING?

- The educational value of printing as a school subject is far greater than the technical knowledge it imparts.
- Unlike other manual studies, printing affects the lives of all of us. It becomes a part of school life as completely as it does of community life.
- Printing interprets aims and ideals of your school to the community and is a powerful force at your command for winning public support for your educational program.
- As one of the fine arts, printing fosters an appreciation of all the arts, and is rich in the finest cultural influences.
- A potent influence for leadership, printing teaches accuracy, neatness, orderly thinking, honesty and truthfulness. It arouses civic pride and interest, and develops a sense of cooperative values.
- Printing provides the opportunity to "learn by doing," which is the goal of most present-day teaching.
- Printing brings the student into close contact with his other studies—English, History, Geography, Mathematics and Art—widening his field of knowledge and sharpening his mental faculties.
- Printing is often called "Mother of Progress," and without it knowledge as we know it today would not exist. As such it is an integral part of our educational system, and no school can afford to be without it.
- Have you a copy of "Why Teach Printing?" Then by all means send for it today. It's free!

ATF has devoted 45 years exclusively to the service of school printing plants, and the development and building of printing equipment. A competent staff of engineers is available to assist in the planning of your department... advice in the selection of units best suited to your needs... help you in solving any difficulties in the layout or organization of your printshop.

On the following pages are three specimen layouts as examples of ATF's *free* Engineering Service to schools. Don't expect to find the answer to your particular problem here... due to lack of space we are able to show only a few of the many layouts we are prepared to furnish. In all school printshop layouts, due consideration is given the problem of safety first, lighting of the room, and convenient, easy routing of materials.

Feel free to call on us for whatever information or suggestions you need. You are welcome to this service without obligation, of course. Simply fill in, sign and send the prepaid postal card that is provided for your convenience on page three.



THE BEST TYPE MADE

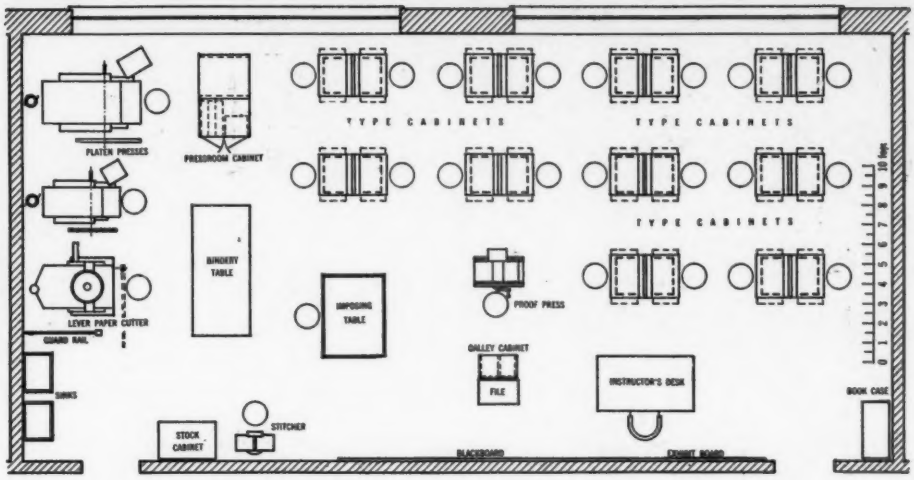
Wherever the printed word appears, you are sure to find American types in those readable, usable faces that lend distinction to much of the everyday printing. Nearly a century of experience and the finest materials and workmanship are united in the manufacture of American types. Every school printshop deserves the best, which is truly American.

The Handy Index of American types will easily and quickly familiarize even the beginner with the modern, as well as time-tested faces. Over 200 type faces grouped by style characteristics, width and height, with a convenient pica measure on every page. Cross-indexed for ready reference. A copy is yours for the asking. Use prepaid postal card provided on page three.

AMERICAN TYPE FOUNDERS

Department of Education · 200 ELMORA AVENUE, ELIZABETH, N. J.

Junior High School



The ideal layout for Junior High School printing unit to take care of 20-23 pupils. Approximate room size, 22x45 feet.

Complete printshop training includes all essential operations—from setting of type, through printing, to cutting and binding. We show on these pages only a few pieces of the large assortment of equipment we carry for the school printshop. A complete listing and full description of all ATF school printshop equipment will be sent upon request. Use the prepaid postal card on next page.

SCHOOL BY

Challenge Lever Paper Cutter

Scientifically designed, yet simply constructed. No. 265 *Challenge* is safe, easy to operate, and thoroughly dependable.

American Ideal School Type Cabinet

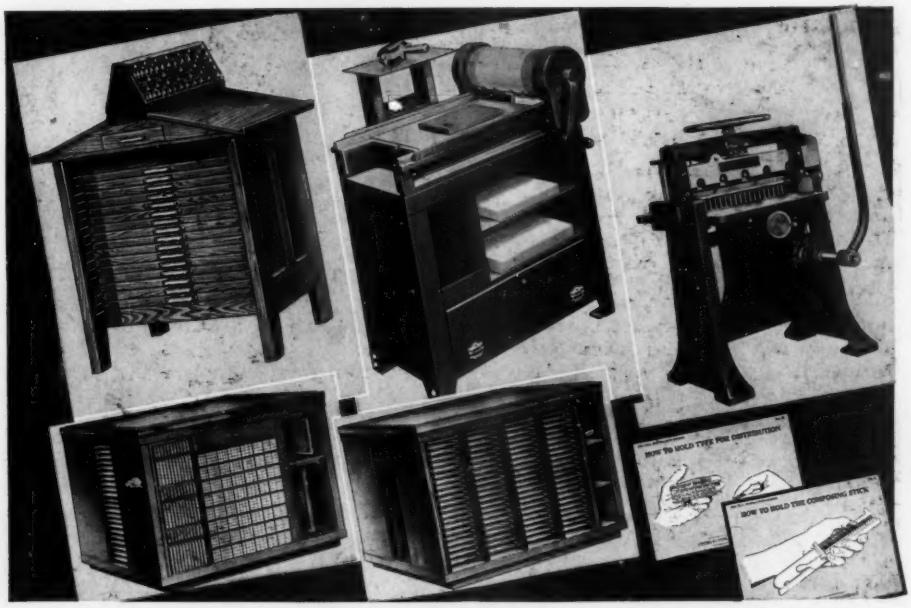
Specially designed and constructed for school use. Two students can set type at the same time at this cabinet. Complete with job and font cases, lead and slug rack. Substantially built of seasoned hardwood, flat varnish finish.

No. 1 Vandercook Proof Press

Accurate, rigid and accessible, this is an ideal machine for all hand inking work on 14x18 inch printing surface. Suitable for either Junior or Senior High Schools. (See opposite layout.)

American School Imposing Table

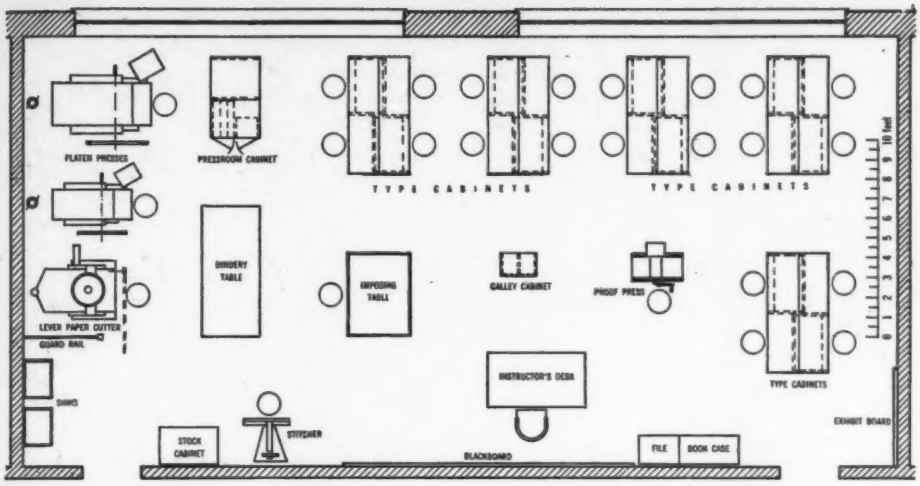
Ideal in size and design for both Junior and Senior High Schools. Illustrated above are both sides and ends of the 51x39 inch table.



Visual Aids

Twenty-four wall charts illustrating proper methods of performing the basic operations in printing. Facilitate training and eliminate the need for distracting repetition of instruction. Printed on 10-ply cardboard, 11x14 inches, suitable for hanging on the wall. Only $2 for the set of 24. Ask your purchasing department to order direct from nearest ATF Branch Office.

Feel free to call on us for whatever information you may need — whether it relates to the small GENERAL SHOP UNIT or to the large Vocational Training Unit. You are welcome to this service by ATF's Education and Engineering Service. Simply fill in and mail the prepaid postal card provided for your convenience on next page.



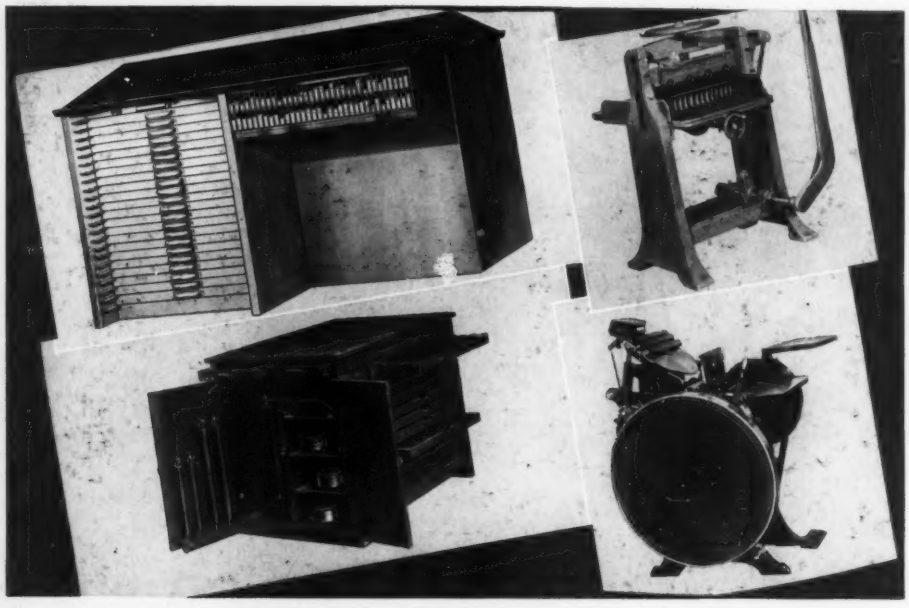
Senior High School

The ideal layout for Senior High School printing unit to take care of 20-23 pupils. Approximate room size, 22x45 feet.

LAYOUTS ATF

The same engineers who have laid out many of the leading commercial plants in the country are at your disposal in laying out, or enlarging, your school print-shop. Don't hesitate to avail yourself of this service. There is absolutely no cost or obligation involved. Our educational service covers the entire range of printing departments from the smallest general shop unit to the trade training shop.

TEACH PRINTING
A PUBLICITY MEDIUM UNDER SCHOOL CONTROL



New Series C & P Platen Press

In three sizes—8x12, 10x15, 12x18—suitable for either Junior or Senior High Schools. Capable of as much as 2700 impressions per hour, yet easily moderated to fit the pace of slower students.

School Pressroom Cabinet

A combination cabinet and stock table with ink, rag, roller compartments and drying rack.

C & P Buckeye Lever Paper Cutter

Popular new 26½-inch lever paper cutter, modern in design, vitally improved in operating efficiency.

Standard School Type Cabinet

For high schools and colleges. Accommodates four students, two on each side. Substantial steel construction, olive green baked enamel finish.

23 convenient Branch Offices ready to serve you in

ATLANTA, GA. • BALTIMORE, MD. • BOSTON, MASS. • BUFFALO, N.Y. • CHICAGO, ILL. CINCINNATI, OHIO • CLEVELAND, OHIO • DALLAS, TEXAS • DENVER, COLORADO DES MOINES, IOWA • DETROIT, MICHIGAN • KANSAS CITY, MO. • LOS ANGELES, CAL. MILWAUKEE, WIS. • MINNEAPOLIS, MINN. • NEW YORK, N.Y. • PHILADELPHIA, PA. PITTSBURGH, PENNSYLVANIA • PORTLAND, OREGON • ST. LOUIS, MISSOURI • SAN FRANCISCO, CALIFORNIA • SEATTLE, WASHINGTON • WASHINGTON, D. C.

AMERICAN TYPE FOUNDERS • *Department of Education*

Kindly send me information relative to Printing Equipment and Supplies needed in (check one):

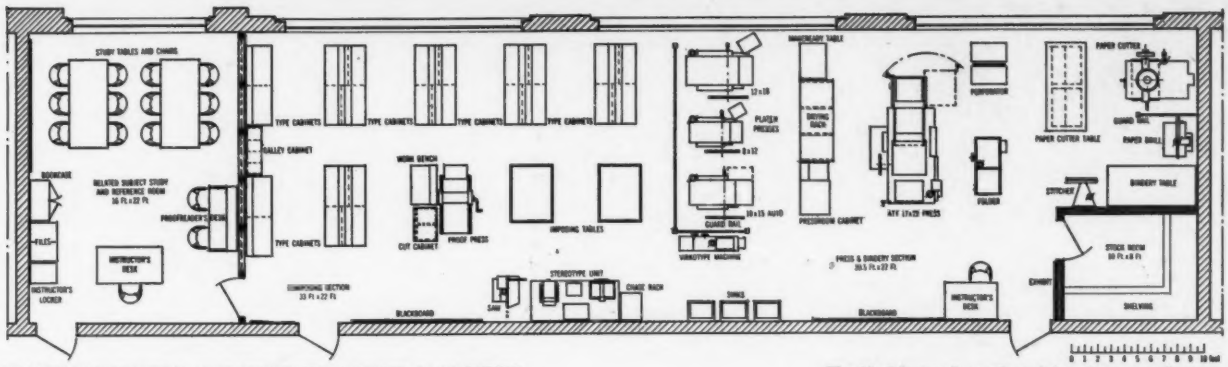
☐ General Shop Unit — To accommodate_____ pupils at a time.
☐ Junior High School — Size of room available_____ by_____.
☐ Senior High School — Interested in an ideal setup. ☐
☐ Vocational School — Appropriation limited to $_____

Name_____

Position_____

School_____

City_____ State_____



VOCATIONAL PRINTING UNIT SUGGESTED LAYOUT, 24-32 PUPILS

The ideal layout for trade training classes to take care of 24 to 32 pupils. Approximate room size, 22x72 feet.

Trade

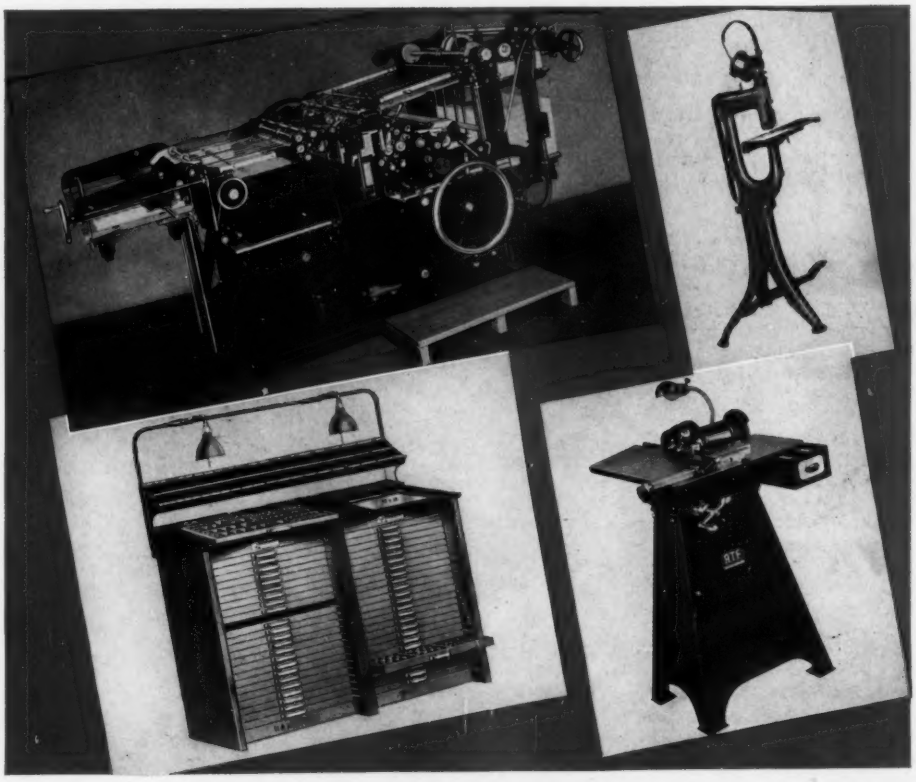
Training Classes

Double-Tier Wall Type Cabinet

Easy access to all compartments of type cases. Large working surface that takes full-size working galleys. All-steel construction, olive green baked enamel finish.

ATF Composing Room Saw

For heavy duty, as well as all light work encountered in trade training classes. Newest safety and economy features.



New ATF 17x22 Kelly Automatic Press

The most economical, efficient flat-bed cylinder press for the training of trade school pupils. The press that is found in so many commercial printing plants throughout the country today.

Boston Wire Stitcher

Easily arranged for saddle or flat stitching and operated by foot pedal up to ½ inch thickness. Its speed is equal to the operator. Also power stitchers in all sizes.

Types used: Lydian, Bernhard Gothics, Raleigh Gothic Condensed, members of Bodoni family, Alternate Gothics. Printed on Kelly Presses with ATF Non-Offset Guns 9-38

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Dept. of Education *Elizabeth, N. J.*

(Continued from page 448)

commissioner of schools in Ionia County, Mich. Later he became assistant principal of the high school and director of the continuation school in Ionia. He also served in the department of commerce in the Central State Teachers' College and has been guest professor at Iowa State College, and at the University of Michigan.

He is a member of the Michigan Education Association, the Michigan Society of Vocational Education, the National Education Association, the American Vocational Association, and the Michigan Industrial Education Society. He was president of the Omega Chapter of Phi Delta Kappa in 1935.

He is the author of a number of pamphlets and publications on industrial arts and vocational education, and has contributed important articles to the professional publications in his field.

• WAYNE P. HUGHES is on leave of absence from his position as assistant professor of industrial arts, Eastern Illinois State Teachers College, and is at present a teaching fellow at the new established center for safety education at New York University.

• W. FREDERICK THOMAS has been appointed Acting Director of Industrial Arts, Youngstown, Ohio.

• EDWARD HUTTENGA has resigned as instructor in woodworking at Big Rapids, Mich., high school, to accept a similar position in the Grand Haven, Mich., high school.

New Publications

Provincial Furniture

By John Gerald Shea and Paul Nolt Wenger. Cloth, 161 pages, 9 by 12, illustrated. Price, $3.50. Published by The Bruce Publishing Company, Milwaukee, Wis.

Another book of interesting and quaint designs by the authors of *Colonial Furniture*. Following the example which they established in their first volume, the authors have selected a goodly number of authentic articles of an accepted style of furniture. In their selection, they were guided by the criteria of makability, value, and authenticity. In this volume, they offer the interested craftsman fifty drawings of correct French provincial designs fully detailed and dimensioned so that the articles can be readily made.

Besides these definite plans, there are historical notes covering the various furniture periods from 1100 to 1793. There are also sketches and explanatory notes clarifying constructional features met with in the production of provincial furniture. Notes on wood finishing as applied to this type of furniture are also included.

Foremanship and Supervision

By Frank Cushman. Cloth, 286 pages, 5¼ by 7½, illustrated. Price, $2.50. Published by John Wiley & Sons, New York City.

This is the second edition of a book that has been found helpful by many men engaged in the upgrading of foremanship and supervision in industry, business, and public service corporations.

Part I of the book outlines clearly the results which may be expected from the use of the conference method, how the leader must plan his work and what divisions are available to him so that he may retain control at all times.

Part II shows how the conference procedure may be applied especially to foremanship training and Part III outlines how it is applied to work with vocational teachers and supervisors.

Woodworking Through Visual Instruction

By J. I. Sowers. Cloth, 72 pages, 8½ by 11¼, illustrated. Price, $1.50. Published by International Textbook Company, Scranton, Pa.

A graded course of woodworking for grades 7, 8, and 9. The instruction sheets are excellently illustrated. Full use is made of the fact that pictures possess more descriptive value than words, hence the verbal instructional material is kept down to a minimum.

With the large shop classes now so prevalent, this type of instructional material will be found to be a boon to the instructor. Even the less gifted student will find that visualization of each individual step, as well as the finished project is a great help toward understanding what is to be done and how it is to be done in order to construct a given article.

Designs for Piercing, Chasing, and Etching

By William Dixon, Incorporated, Newark, N. J. Paper, 8¾ by 11¼.

A portfolio containing 32 plates of excellent ornamental designs; silhouettes of birds, animals, geometric designs, and scenes of various kinds; borders, and initials.

All designs are printed on one side of the paper only, so that the pages may be mounted for classroom use.

The Dixon Manual

By William Dixon, Incorporated, Newark, N. J. Paper, 8¾ by 11¼.

This portfolio contains 19 projects, all of which possess artistic merit and usefulness. Some of them are so simple that the beginner can readily make them, while others will tax the skill of the experienced metalworker.

Besides the designs offered, there are directions for students on the various processes given in concise but thorough fashion, which will be found valuable by all metal crafters.

All of the material in this portfolio is printed on one side of the paper only, so that the pages may be mounted for classroom use.

Directory of Industrial-Arts Teachers in Kansas

Paper, 31 pages. Issued by the Kansas State Teachers' College, Pittsburg, Kans.

A list containing 738 names of teachers of industrial arts in the public schools and other schools of Kansas.

Beginning Woodwork Projects

By Howard C. Nelson. Paper, 111 pages, 6 by 9, illustrated. Price, 76 cents. Published by the Manual Arts Press, Peoria, Ill.

In this book the author furnishes step-by-step directions for constructing a foostool, kitchen stool, wall cabinet, taboret, cane-top stool, wastebasket, telephone table, porch swing, bookrack, sewing cabinet, fernery, table, and utility cabinet.

Advanced Woodwork Projects

By Howard C. Nelson. Paper, 101 pages, 6 by 9, illustrated. Price 76 cents. Published by the Manual Arts Press, Peoria, Ill.

Following the method adopted by this writer in his *Beginning Woodwork Projects*, full directions are given in this volume for constructing a magazine table, butterfly table, cedar chest, spinet desk, end table, library table, vanity bench, vanity dresser, radio table, library desk, bookcase, and buffet.

Designs for Tooled Leather — I and II

By Louise C. Hoefer. Paper, 8¾ by 11½. Price, 75 cents each. Published by the author at Glendale, Calif.

Book I on designs contains 18 plates, giving about 50 designs applicable to many different types of projects. These designs, for the most, are full size. Book II is a collection of conventional designs using flowers, scrolls, and other familiar motifs. The designs are printed on heavy white paper so that tracings may be made from them.

Leathercraft Instructions

By Louise C. Hoefer. Paper, 8¾ by 11½. Price, 75 cents. Published by the author at Glendale, Calif.

This book on instructions contains information for the beginner on art leatherwork in very concise form.

Objectives and Problems of Vocational Education

By Edwin A. Lee, Ph.D. Cloth, 476 pages, 6¼ by 9¼, illustrated. Price, $3.50. Published by the McGraw-Hill Book Company, New York City.

This is the second edition of this very helpful symposium on the subject of vocational education. The material has been thoroughly revised, and the new legislation, statistical changes, new techniques and developments, have been added. The whole is the product of the efforts of some of the outstanding men in the field.

The subjects covered embrace the ancestry of vocational education; vocational education as a national responsibility; trends in education for the professions; agricultural education in secondary schools; developments and trends in home-economics education; trends in part-time education; trade and industrial education; vocational teacher training: its development and present trends; vocational rehabilitation of the disabled; trends in vocational guidance; industrial-arts education; the employer's attitude toward vocational education; organized labor's attitude toward vocational education; the vocational-education movement; a critical inventory of policies; commercial education: principles, practices, trends; and a forecast and prophecy.

Creative Teaching: Industrial Arts and Vocational Education

By F. Theodore Struck. Cloth, 648 pages. Price, $3.50. Published by John Wiley and Sons, 440 Fourth Avenue, New York City.

The opening chapter of this book presents the broad social-economic goals toward which progress should be made in creatively taught, and democratically administered practical arts and vocational education. In following chapters the author shows how the broad goals serve as essential guides to teaching methods and procedures. The book indicates how instruction is individualized; how character and personality are developed and how socially conceived discipline is secured. It discusses democratic class management and indicates how learning is helped through motivating instruction. A chapter devoted to teaching pupils how to study will be of interest to many. Advantages and limitations of various types of lesson planning are given. Visual aids are treated as a means of supplementing and modernizing other procedures. Discussion methods especially suited to adults are featured. The purposes and techniques of socialized instruction are presented. Various plans of teaching, calling for some form of unit assignments, are explained. The purposes and techniques of individual instruction are considered. Many other learning techniques are discussed. The author believes that the better teachers use many aids and devices. He indicates types, sources, and procedures. Tests and measurements are treated from the angle of using them as aids to learning. Various types are illustrated. Industrial arts, adult, and apprenticeship education are treated at length. Extracurricular activities are discussed as essential aids to learning. A chapter is devoted to what creative teaching involves. The closing chapter is on integration — its meaning and implications.

In the reviewer's judgment, the book is comprehensive and sound in its philosophy. The treatment is practical and scholarly. Sixty illustrations add to its interest. It is one of the outstanding books in its field. Its greatest use will be as an aid to prospective teachers, to teachers and administrators in service, and to students of education. — *P. L. Cressman*, State Director of Vocational Education, Harrisburg, Pa.

(Continued on page 20A)

KEEP A MAN IN A WINDOWLESS ROOM . . .

Let a man be kept in a windowless room from earliest childhood to manhood . . . to him, that room would be his universe. His muscles would be flabby, his mind that of a child. If a window were cut in the wall he would go to the window, look out, be curious . . . but he would not want to leave his room.

But let him get a taste of the satisfactions, the thrills, the abiding happiness to be found in that world outside—and nothing could keep him back.

That is a graphic example of the extent to which every man is the product of his environment. If he is accustomed to inferior surroundings, and knows no other, he will end up as an inferior man. His environment has cut him down to its size. But let him know the pleasure, the satisfaction—call it what you will—of *better* things, and he will want them and his abilities will develop accordingly.

There is a lesson here for every student of mechanical drawing. The student who is destined to go far in his chosen profession, surrounds himself with the best examples of work he can find. He reads something of the achievements of the leaders in his field. And in addition to all that, he takes care to see that the drawing set he uses is the finest he can obtain. This is the first step toward that "divine discontent" that leads upward. Beautifully made, beautifully balanced instruments school their owner's hands to the touch of fine things, strengthen his knowledge of the difference between the good and the shoddy, foster the habit of finished workmanship. They give him the confidence, the pride in his work so essential to accomplishment. There is a very real "magic" in a fine possession—particularly one that is used day in and day out. Drawing instruments are used through school, through college, even through the student's professional career. How essential it is then that they be selected with the utmost care.

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World Famous Quality
DRAFTING INSTRUMENTS

Dietzgen Drawing Instruments are manufactured in a wide array of styles, grades and assortments to meet the purse and service needs of everyone from the beginner to the professional draftsman and scientist. Regardless of price, the name Dietzgen always identifies a greater value.

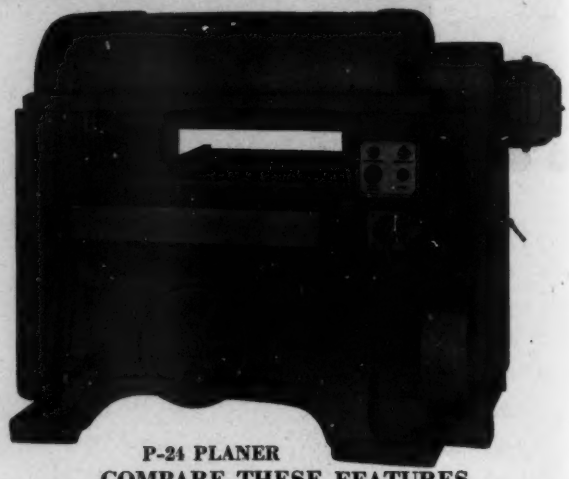
AVA

You are cordially invited to visit the Eugene Dietzgen Co. exhibit, Booth No. 54, American Vocational Association Convention, St. Louis, Missouri, Nov. 30-Dec. 3, 1938.

SAFE TO BUY SAFE TO USE

NEARLY FIFTY YEARS of EXPERIENCE MODERNIZED

your investment is your students are SAFE



Nearly a half-century of building satisfactory machinery for the wood-working industry has taught us how to produce equipment for long life and consistent low-cost operation.

Modern design has made our line safer and cheaper to use — as exemplified in the P-24 planer illustrated.

Ready acceptance of the new Crescent line by the wood-working industry makes it imperative that you investigate.

cabinet finish up to 60 feet per minute guaranteed

WRITE FOR LITERATURE

P-24 PLANER

COMPARE THESE FEATURES

- Reeves variable speed drive
- Finger-tip control
- Built-in direct motor knife grinding and jointing attachment
- Totally enclosed with aluminum guards
- Grease-gun lubrication
- Precision type ball bearings

THE CRESCENT MACHINE CO., LEETONIA, O., U. S. A.

(Continued from page 17A)

MISCELLANEOUS BOOKS

Among the books received which may be of interest to instructors of industrial arts and vocational education are the following:

Vocations in Short Stories

By Vera Eleanor Morgan. Paper, 47 pages, 5½ by 8½. Price, 50 cents. Published by the American Library Association, Chicago, Ill.

A bibliography of short stories which give information on vocations.

Through by Rail

By Charles Gilbert Hall. Cloth, 152 pages, 6¼ by 9½, illustrated. Price, $1.32. Published by The Macmillan Company, New York City.

Skyways

By Charles Gilbert Hall. Cloth, 141 pages, 6¼ by 9½, illustrated. Published by The Macmillan Company, New York City.

First Things First

By Mrs. Agness Boysen. Cloth, 185 pages, 5¾ by 8¾, illustrated. Pirce, $2. Published by the Associated Authors, Chicago, Ill.

Scholastic, Economic, and Social Backgrounds of Unemployed Youth

By Walter F. Dearborn and John W. M. Rothney. Paper, 172 pages, 6 by 9. Price, $1.50. Published by the Harvard University Press, Cambridge, Mass.

Business Correspondence and Office Management

By Edward A. Duddy, L. E. Frailey, and Raymond V. Cradit. Cloth, 124 pages, 5¾ by 8½, illustrated. Price, $1.75. Published by the American Technical Society, Chicago, Ill.

New Practical Chemistry

By Newton Henry Black, and James Bryant Conant. Cloth, 621 pages, 8 by 5½, illustrated. Price, $1.80. Published by The Macmillan Company, New York City.

CHRISTMAS SEALS

Help to Protect Your Home from Tuberculosis

Association News

AVA CONVENTION AT ST. LOUIS, MISSOURI

The following is a condensed program for the annual meeting of the American Vocational Association which will be held November 30 to December 3 at St. Louis, Mo.

Vocational Guidance Section

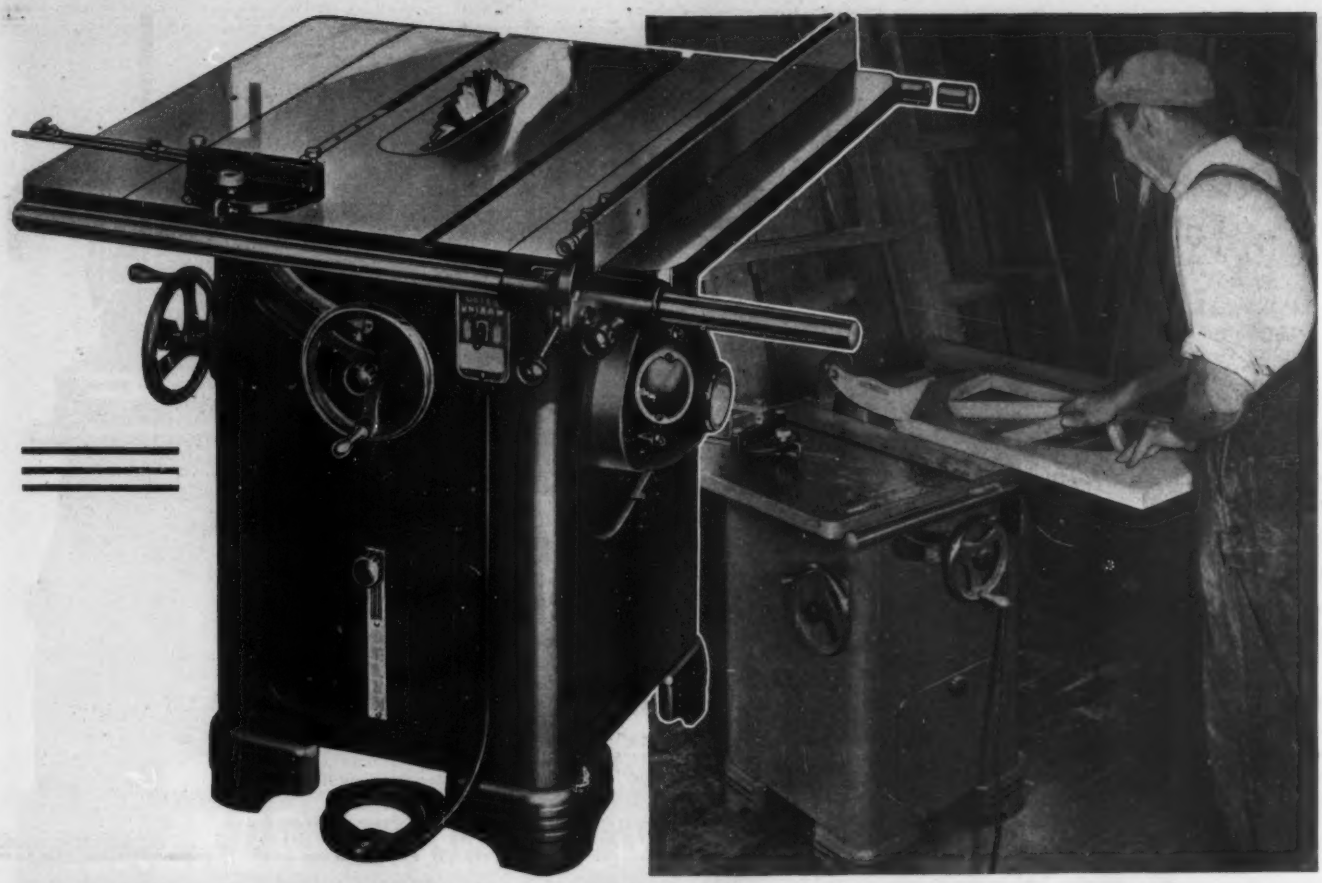
Thursday, December 1, at 9 a.m. Addresses: *Trends and Problems in Vocational Guidance,* Harry D. Kitson, Professor of Education, Teachers College, Columbia University, New York City; *Some Successful Projects in Vocational Guidance,* C. E. Partch, Dean, School of Education, Rutgers University, New Brunswick, N. J.; *Government Agencies and Their Vocational Guidance Objectives,* Mary H. S. Hayes, Director Guidance and Placement, National Youth Administration, Washington, D. C.

Friday, December 2, at 9 a.m. Addresses: *A Fool Proof Job Analysis for Selection and Placement of Workers in Occupations,* C. A. Prosser, Director, William Hood Dunwoody Industrial Institute, Minneapolis, Minn.; *Vocational Guidance from the Standpoint of the Principal,* Franklin J. Keller, Principal, Metropolitan Vocational High School, New York City. A Panel Discussion: *How Can Vocational Guidance Assist Business?,* St. Louis Chapter of National Vocational Guidance Association in charge.

Friday, December 2, at 2:00 p.m. Addresses: *Youth — the Training and the Job,* Harry A. Jager, Chief, Occupational Information and Vocational Guidance Service, U. S. Office of Education, Washington, D. C. *Successful Techniques:* (*a*) *In Measurements,* Fred C. Smith, Dean, School of Education, University of Tennessee, Knoxville, Tenn.; (*b*) *In the Preparation of Teachers,* Ralph E. Pickett, Assistant Dean of Education, New York University, New York City; (*c*) *In Programs with High School Seniors,* Julian C. Aldrich, St. Louis County Guidance Council, St. Louis, Mo.; (*d*) *In Surveys,* Ward N. Black, Assistant State Superintendent of Public Instruction, Springfield, Ill.

Saturday, December 3, at 9:00 a.m. Addresses: *A Rural Youth Vocational Guidance Project,* W. A. Ross, U. S. Office of Education, Washington, D. C.; *Guidance in Smaller Communities,* George E. Hutcherson, Supervisor of Guidance, State

(Continued on page 22A)



REMARKABLE NEW TOOL

-A Perfected Tilting-Arbor Saw!

Tilting Arbor Saws are not new—but a Tilting Arbor Saw with *all* the flaws of existing designs *completely eliminated* is decidedly new! Perfected after seven years of patient testing and experimenting—the new Delta Tilting Arbor Saw is the ideal circular saw for school shops. It is compact, accurate and low-priced. It is fully enclosed making for cleanliness and safety. It is provided with guards that meet the requirements of the Wisconsin Safety Code—one of the strictest in the country. Some of its outstanding points are: Powerful fully enclosed motor; highly efficient "Tex-Rope" drive; perfected raising, lowering and tilting mechanism; new scientifically designed rigid housing; patented double-face, double-lock rip gauge; exclusive precision auto-set miter gauge; patented ripping extensions; sealed-for-life ball bearings; forged alloy-steel arbor; extra large table; "Point-of-use" controls and numerous other features.

DELTA MANUFACTURING CO.
600-643 E. Vienna Ave.
MILWAUKEE, WIS.

Send for 1939 CATALOG

There are so many important new features, so many basic improvements in this new Delta Tilting Arbor Saw that it has been necessary to prepare a complete section in the Delta Catalog to tell the story adequately. Liberally illustrated, this section is a dramatic story of modern engineering progress—and at the same time the complete *inside story* of the tilting arbor saw.

Send for your copy of the new 1939 Delta Catalog illustrating, describing, and listing prices of the complete 1939 line of Delta "Quality" motor-driven tools. Send the coupon TODAY!

DELTA MFG. COMPANY, Dept. U1238
600-634 E. Vienna Ave., Milwaukee, Wisconsin.

Gentlemen: Please send me 1939 Delta Catalog and full details on the New Delta Tilting Arbor Saw.

Name .....

Address .....

City ..... State .....

SOMETHING NEW AND STARTLING in Lathe Values . .

Announcing . . . the TYPE "S" SEBASTIAN LATHE

Showing the new 16" x 6' Type "S" Lathe by Sebastian

Sebastian offers:

STREMELINE DESIGN

All Timken Head assuring More Power.

Speeds Up to 1200 R. P. M.

Pull Knob (Patented) *Control* of apron Friction Clutch giving *Instant Release* of *Feed.*

These and other features put the new Model "S" Sebastian away up at the top in value and away at the bottom in price. Write today for full details of these accurate, precision, convenient cost cutters.

AGAIN Sebastian engineers have given the metal working industry and thrifty lathe buyers something new and startling in lathe values.

This time it's the new Type "S" — a lathe that offers outstanding features in modern design at a price only a few dollars more than the lowest for ordinary, conventional construction.

HERE'S PROOF OF VALUES:

12" x 4' with 1 H.P. motor and control $ 750.00
16" x 6' with 2 H.P. motor and control $1100.00
20" x 8' with 3 H.P. motor and control $1600.00

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(Continued from page 20A)

Department of Education, Albany, N. Y., and Gilbert Pilcher, Counselor to Snohomish Youth, Everett, Wash.; *The New Challenge in Vocational Guidance,* Richard D. Allen, Assistant Superintendent of Schools, Providence, R. I., and Consultant, U. S. Office of Education, Washington, D. C.

Saturday, December 3, at 12:15 p.m. Panel discussion. Topic: *The Occupational Adjustment of Youth.* Leader: Lynn A. Emerson, Professor of Industrial Education, Cornell University, Ithaca, N. Y. Members of the panel: Paul W. Chapman, Dean, College of Agriculture, Athens, Ga.; John J. Seidel, State Director of Vocational Education, Baltimore, Md.; Mary H. S. Hayes, Director of Guidance and Placement, National Youth Administration, Washington, D. C.; Howard Oxley, Director of Education, CCC, Washington, D. C.; Harold T. Smutz, U. S. Employment Service, St. Louis, Mo.; M. Reed Bass, David Ranken Jr. School of Mechanical Trades, St. Louis, Mo.; George E. Hutcherson, Supervisor of Guidance, State Department of Education, Albany, N. Y.; Julian C. Aldrich, St. Louis County Guidance Council, St. Louis, Mo.; Walter V. Bingham, Executive Director, Personnel Research Federation, New York City.

Industrial and Part-Time Education

Thursday, December 1, 9:00 a.m. to 12:15 p.m. Topic: *Procedures in Measuring Accomplishment in Industrial Education.* Addresses: *A Testing Program for Vocational Schools,* Albert G. Packard, Principal, General Vocational School No. 294, Baltimore, Md. *Procedures in Measuring Accomplishments in the: Part-time, General Continuation School,* H. A. Tiemann, Director, Vocational Education, San Diego Public Schools, San Diego, Calif.; *Co-operative Part-Time School,* R. B. McHenry, Director, Industrial Education, Fort Smith, Ark.; *All-Day Unit Classes,* John B. Coleman, Director, Vocational and Adult Schools, LaCrosse, Wis.; *General Industrial School,* J. W. Kelly, State Supervisor, Trade and Industrial Education, Olympia, Wash.; *Evening Trade Extension Classes,* L. K. Covelle, State Supervisor, Trade and Industrial Education, Stillwater, Okla.

Thursday, December 1, 9:30 to 12:15 p.m. Topic: *How to Bring About a Greater Diversity of Occupational Training as Part of the Trade and Industrial Education Service.* Address: *Apprenticeship as a Means of Adding Diversity to Occupational Training in Trade and Industrial Education,* M. M. Hanson, Regional Agent for Federal Apprentice Committee, Washington, D. C. Discussion: George H. Fern, State Director, Vocational Education, Lansing, Mich., and E. F. Daniels, State Supervisor, Trade and Industrial Education, Jefferson City, Mo. Address: *Analysis of Evening Trade Extension Courses in the Light of Fully Meeting Occupational Training Needs in Trade and Industrial Education,* Laurence Parker, State Supervisor, Trade and Industrial Education, Pittsburg, Kans. Discussion: R. D. Dolley, State Supervisor, Industrial Education, Tallahassee, Fla. Address: *What, if Anything, Should be Done Which Will Bring About a Greater Diversity of Occupational Training Through Day Trade and Industrial Schools?,* C. A. Prosser, Director, William Hood Dunwoody Industrial Institute, Minneapolis, Minn. Discussion: Russell J. Greenly, Professor of Trades and Industries, Purdue University, Lafayette, Ind. Address: *What Administrative and Supervisory Devices are Conducive to Bringing About a Diversity of Occupational Training in Trade and Industrial Education?,* N. B. Giles, Agent, Industrial Education, U. S. Office of Education, Washington, D. C. Discussion: J. E. Tepoorten, State Co-ordinator, Madison, Wis. Address: *Possibilities of Increasing the Diversity of Trade and Industrial Service Through Public Service Training,* George P. Hambrecht, State Director, Vocational and Adult Education, Madison, Wis.

Friday, December 2, 2:00 to 4:45 p.m. Topic: *Relationships of Vocational School, Labor, and Industrial Management.* Discussion leader: Lloyd W. King, State Superintendent, Department of Public Schools, Jefferson City, Mo. Addresses: *Youth, Apprenticeship and Organized Labor,* Lawrence M. Raftery, Sixth General Vice-President, Brotherhood of Painters, Decorators and Paperhangers of America, St. Louis, Mo.; *Apprenticeship vs. Vocational Education,* Ernst J. Flentje, Executive Secretary, National Association of Master Plumbers, Washington, D. C.; *The Vocational Student's Opportunities in Industry,* F. M. Karches, Director of Factory Personnel, The Emerson Electric Manufacturing Company, St. Louis, Mo.; *Our Experiences and Observations in Training Men,* Daniel O. Collins, First Vice-President, Bricklayers, Masons & Plasters International Union of America, Washington, D. C.

Vocational Rehabilitation

Thursday, December 1, at 9:30 a.m. One-act play, *It Happens Every Day,* enacted by the staff of the St. Louis Chapter, American Red Cross, showing the need for close relationship between vocational schools and rehabilitation services.

♦ The Second Annual Conference of the Washington Industrial Education Association was held August 15–19, 1938, at Coeur d'Alene, Idaho. Many members and their families attended as well as many visitors. Prominent speakers on the program included, J. W. Kelly, State Supervisor of Trades and Industries; G. S. Schaller, Pro-

(Continued on page 25A)

56,000 Driver-Built Band Saws Contributed To Its Design

NEW MODEL! 14" BAND SAW $57.50
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Actually 3 tools in 1! Use it as portable sander, edge sander or spindle sander. Also for resurfacing blackboards, desks, wood trim and stair treads. *Thousands in use!*

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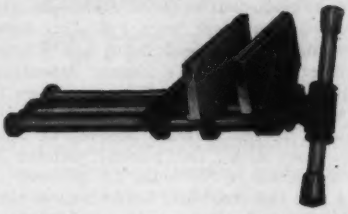

COLUMBIAN Rapid Acting Woodworkers' Vises are designed for school and industrial shops where time is an important factor. Especially adaptable where large changes in jaw opening must be made frequently.

Simple rapid acting mechanism consists of a bronze half-nut operating in the groove produced by milling off a section of each thread for the length of the screw. A slight turn of the handle engages the threads of the nut and screw, and a half turn tightens the vise on the work.

COLUMBIAN
Malleable Iron Machinists' Vises

COLUMBIAN Malleable Iron Machinists' Vises are designed to give the service required of quality tools. Guaranteed not to chip, crack, or break.
JAW FACES of hardened tool steel, pinned securely so that they will not come loose in use, can be replaced.
STEEL SCREW and MALLEABLE IRON NUT are designed to give maximum strength. A hardened steel thrust washer under the screw head prevents wear and eliminates end play. STEEL BALL ENDS on the handle are forged from the handle stock itself, and will not come loose.
SWIVEL BASE VISES are locked in any position by a forged steel lock bolt, and steel clamping nut.
BASES on all Columbian Machinists' Vises are machined flat to permit solid mounting and eliminate cutting bench tops.

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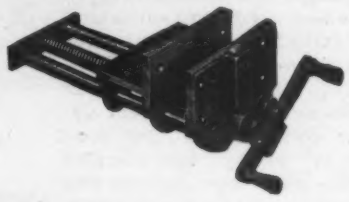

Extra heavy steel screw with carefully cut double threads operates in a solid malleable iron self-centering nut and insures positive fast action. Cold rolled steel guide rods, with drag bar as screw bearing, insure alignment and accuracy.

ADJUSTABLE STEEL HANDLE (when specified) increases speed of operation. With the handle centered at the screw head, the shortened radius permits quick adjustment of opening. By extending the handle, extra leverage is obtained to tighten the vise.

The Columbian Line also includes Combination Pipe Vises, Hinged Pipe Vises, Garage Vises, Bench Anvils, and "C" Clamps. Write us for complete catalog and name of the Hardware or Industrial distributor carrying Columbian Vises in stock.

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(Continued from page 22A)

fessor of Engineering, University of Washington, Seattle; C. R. Frazier, Principal, Edison Vocational School, Seattle; Ben. H. Kizer, Chairman, Washington State Planning Council; Dr. O. C. Pratt, Superintendent of Schools, Spokane; C. H. Odom, State Supervisor for Vocational Rehabilitation; Celia Shelton, Director of the Junior Employment and Counciling Service of Seattle; and Ed. Sorger, Supervisor of Safety, State Department of Labor and Industries.

Committees on arrangement and social affairs included E. J. Griffin, L. H. Bates, and George Theordorson, and the Program committee includes A. H. Roos, D. R. Lincoln, W. D. Goble, and Dorothy Mathews.

Officers of the W.I.E.A. are H. G. Halstead, president, Seattle; C. T. Miller, vice-president, Tacoma; and A. H. Drews, secretary-treasurer, Everett.

New officers nominated for 1939 are: For president, H. G. Halstead, Seattle, and W. C. Hawes, Spokane; for secretary-treasurer, J. D. Youngsman, Spokane; Gordon Smith, Seattle, and L. H. Bates, Spokane. These officers will be elected at the fall regional meetings to be held in October. — *A. H. Drews, Secretary.*

♦ The Four-State Regional Conference on Problems of the Industrial-Arts Teacher and Supervisor assembled at Kansas State Teachers College, Pittsburg, Kans., October 7 and 8.

The conference was organized into five sessions, each under the guidance of a chairman with a committee to bring the delegates a specific topic. Dr. W. T. Bawden, head of the department of Industrial and Vocational Education at the Kansas State Teachers College, called the conference to order, and presented R. B. McHenry of the Fort Smith, Ark., city schools, who was chairman under the topic "Administrative Problems of the Supervisor." Professor DeWitt Hunt, of the State A & M College, Stillwater, Okla., presided over the session discussing "Techniques of Shop Organization and Management."

At the Friday evening dinner session Dr. Brandenburg was toastmaster, with C. B. Gatchell leading the discussion on "Industrial Arts for the Superintendent and Principal."

At the meetings Saturday morning, Prof. R. L. Schwanzle, Pittsburg Teachers College, and his committee presented "Philosophy of Education as Applied to Industrial Arts." Verne L. Pickens of the Kansas City, Mo., city schools, conducted the final meeting Saturday afternoon, on "Improvement of Teachers in Service."

At a business session held Saturday morning the conference unanimously adopted a resolution asking President Brandenburg to call the conference in Pittsburg for 1939 at a date to be specified later. The same general committee which was responsible for this year's meeting was elected to carry over for the conference for next year.

Those who served on this committee were the following city supervisors: O. B. Badger, Tulsa, Okla.; L. E. Falgren, Kansas City, Kans.; C. B. Gatchell, Joplin, Mo.; R. B. McHenry, Fort Smith, Ark.; J. C. Woodin, Wichita, Kans. Also, from Kansas State Teachers College: Otto A. Hankammer, R. L. Schwanzle, and W. T. Bawden. The latter three men comprised the executive committee, with W. T. Bawden as general chairman. — *Laurence G. Cutler, Instructor Printing, Kansas State Teachers College, Pittsburg, Kans.*

♦ Since the Wayne University Foremanship Conference Service was established a little more than a year and a half ago with Robert L. Howard as conference leader, 18 conference groups representing 54 different organizations have met to discuss managerial or industrial training problems. These groups have been made up of more than 450 different individuals, the majority of whom are engaged in educational work in the industries.

The conference service has been set up to assist Detroit industries in solving its training problems. Three types of service are available: (1) The training of conference leaders for those organizations who wish to use these men to conduct foreman conferences; (2) holding conferences of foreman groups made up either of foremen from a single plant or from several different plants; (3) foreman-training classes dealing with subject matter of current importance to local firms. Topics such as safety, departmental housekeeping, control of quality, reduction of worker effort, and better personnel relations, are taken up.

The Service represents another attempt by the Detroit Board of Education to bring a rounded, practical program of vocational education to Detroit people, both young and adult groups. It was established at Wayne University with the co-operation of the State Board of Control for Vocational Education as a result of requests for help in foreman training by Detroit industries.

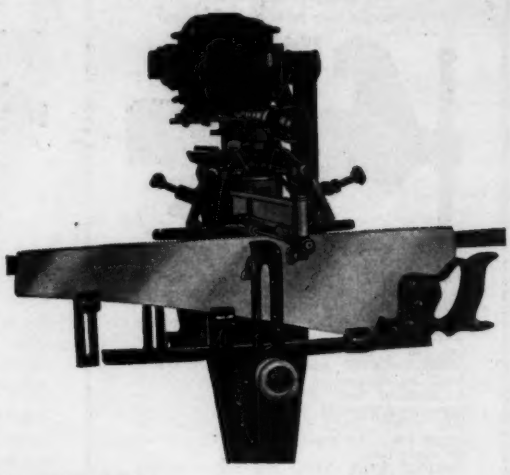
♦ The industrial-education section of the Minnesota Education Association met at an industrial-arts luncheon on Friday, October 28, at Minneapolis, Minn. After the business meeting, Clyde A. Bowman, Dean, Division of Industrial Education, Stout Institute, Menomonie, Wis., spoke on "When is Industrial Arts Progressive?"

The industrial-arts supervisors meeting held at 3 p.m. on the same day, was presided over by Guy O. Tollerud of Austin. He introduced Dr. Homer J. Smith, Professor Industrial Education, University of Minnesota, who spoke on "Reactions to Trends."

At the Minnesota Vocational dinner, Clyde A. Bowman spoke on "Social and Economic Aspects of Vocational Education."

Keep your Saws PERFECT with *the Foley Automatic Saw Filer . . . .*

In student's hands, saws dull quickly, and a fast, accurate method of sharpening them in the school is a decided advantage. The FOLEY does a quick, perfect job of saw filing. All hand saws (including back saws as fine as 20 points to the inch) cross-cut circular saws up to 24", and band saws ⅛" to 4½" wide are filed quicker and better than the best hand filer could do. Every tooth is filed exactly uniform in height and spacing so that a smooth, straight, clean cut is assured. No eye-strain in filing with a FOLEY.



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See the Foley Exhibit at the NEW YORK POWER SHOW, Grand Central Palace, December, 5—10

Foley Retoother

If you have a large number of hand saws to keep in condition, new teeth can be cut with a Foley Retoother in 3 minutes, then finished up on the Saw Filer. This saves time and cost on saws in bad shape, instead of doing the whole job with the Foley Filer

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News Notes

♦ A class in blueprinting for carpenters has been established at Emporia, Kans. Mr. A. E. Buck is instructor of the class.

♦ A new curriculum in welding engineering has been introduced in the college of engineering, Ohio State University, Columbus, Ohio. The course is intended to meet a demand for men trained in practical welding. It embraces all branches of modern welding and seeks to supplement the training of metallurgical, industrial, and mechanical engineers with some of the training of the others.

♦ More than 10,000 men and women from all parts of the world assembled in the Stevens Hotel, Chicago, October 10–14, as delegates to the National Safety Council's Silver Jubilee Safety Congress and Exposition. The discussions related to various kinds of accidents — industrial, traffic, home, and public. More than 140 exhibits were displayed, including many demonstrations. A special session on safety education in schools was a feature, with talks on safety by a number of well-known speakers.

♦ A new shop addition has been erected at the Argentine High School, in Kansas City, Kans. The addition will be used to house vocational-training classes for students living in Kansas City.

♦ The National Society for the Prevention of Blindness, 50 West 50th St., New York City, is collecting information relating to industrial or occupational eye hazards — both accident and disease hazards. The information will be used in the revision of the booklet, "Eye Hazards in Industrial Occupations," by Lewis H. Carris. The purpose of the society is to enlist the interest of those who have had opportunity to observe such hazards and to work toward their elimination.

♦ The 1938–39 series of Sunday and weekday courses of demonstration lectures and gallery talks grouped under the general "Study Hours on Color and Designs," comprise courses for the public, for members of the Metropolitan Museum of Art, New York City, and for teachers of the city of New York.

♦ A mechanical research conference sponsored by the New York State Publishers Association will be held in the Printing and Photography laboratories of the Rochester Athenaeum and Mechanics Institute on February 6 and 7, 1939.

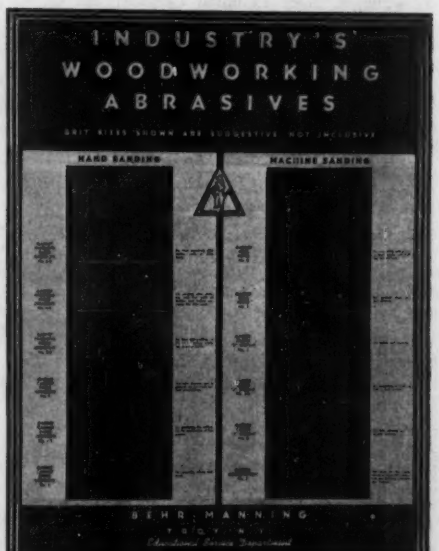
♦ The Seventh National Ceramic Exhibition opened at the Syracuse Museum of Fine Arts, Syracuse, N. Y., on Thursday, October 27, and will continue to November 20, inclusive.

♦ The Industrial-Arts Department of the Madison, Wis., school system, has established a course in safe automobile driving. Dual-control cars have been provided and the instruction is supplemented by the latest and best in the way of printed materials.

New Products

The Behr-Manning Corporation, Troy, N. Y., has issued a new product chart in response to requests from numerous woodworking instructors for a further treatment of the subject of coated abrasives.

This chart is a continuation of the Behr-Manning educational program, which to date has consisted of four entirely distinct but closely related items: A lecture course on coated abrasives, a manufacturing wall chart, a set of physical samples, and a booklet entitled "Abrasive Papers and Cloths for the Student and Home Craftsman."



To this new product chart are attached sample swatches of garnet paper, garnet cloth, and garnet combination as used in woodworking plants throughout the country. The 14 by 18-in. chart is sufficiently small to be hung in a prominent spot on the wall of the average classroom or shop, and yet large enough to invite student inspection and study.

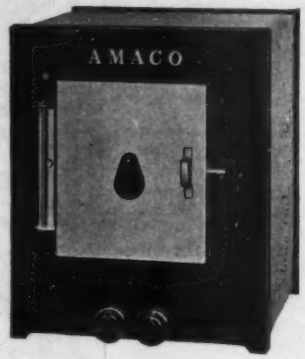
(Continued on page 29A)

AMACO

Equipment and Supplies for the POTTERY WORKSHOP

ELECTRIC KILNS — Seven sizes of Amaco Electric Kilns range in price from $17.50 to $690.00. The No. 2 Kiln at $98.00 is illustrated. Ease and economy of operation, convenient installation in any room, and other outstanding features warrant their selection for the modern pottery workshop.

POTTERS' WHEELS — A portable, constant speed wheel at $98.00; a variable speed wheel with foot control at $179.00.



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See Exhibit of American Vocational Education Convention.

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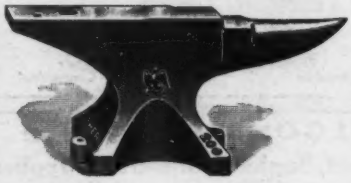

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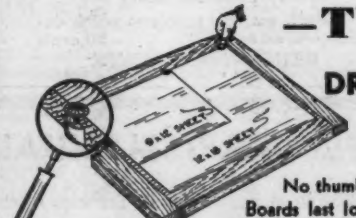

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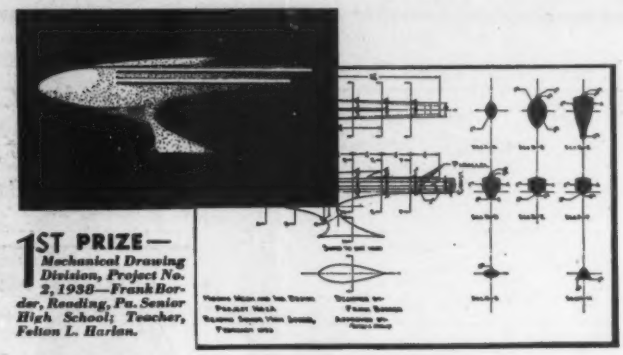

1ST PRIZE— *Mechanical Drawing Division, Project No. 2, 1938—Frank Border, Reading, Pa. Senior High School; Teacher, Felton L. Harlan.*

It is a pleasant coincidence that for 1939, the 10th Anniversary of the Chas. M. Higgins Memorial Awards, sponsored by Scholastic Magazine, we can announce the establishment by the trustees of the Carnegie Institute of Technology of a scholarship for the mechanical drawing student who enters the best work in the Higgins or Dixon Mechanical Drawing Division of the Scholastic Awards.

For 1939, Higgins offers two projects in mechanical drawing besides the usual free-hand competitions in the Black Drawing Ink and Colored Drawing Inks Division. Full details and how to enter these contests will be sent on request.

You are cordially invited to visit the Higgins Exhibit—Booth 23 at the 1938 Convention of The American Vocational Association

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The following new texts have been especially prepared for school use. An examination will convince you of their suitability to your classroom needs. Any books sent for 30 days ON APPROVAL inspection subject to our educational discount if retained.

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Sheet Metal Work — Neubecker	2.50
Elements of Electricity — Esty and Millikan	2.00
Painting and Decorating — Dalzell and Sabin	1.50
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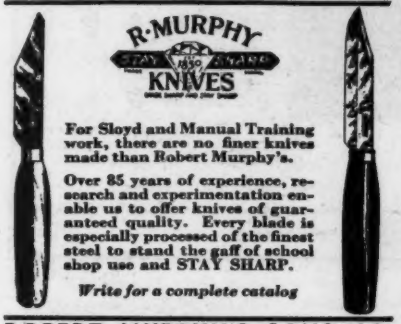

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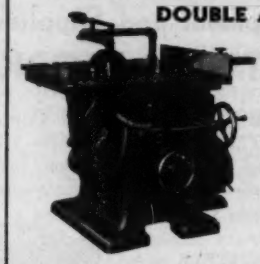

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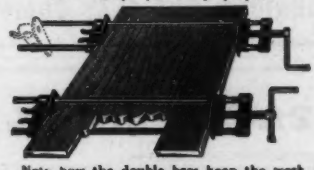

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(Continued from page 26A)

There are twelve garnet samples in all, each 3 by 3¼ in. in size, arranged in two separate columns under the headings "Hand Sanding" and "Machine Sanding." It is worthy of note that each has been left free at the bottom, so that the students may actually "get the feel" of the various grit sizes and backings. Finally, each sample is complete with the proper grit and backing designations, as well as a brief description of a common use or application for which it is well suited.

Instructors desirous of receiving one of these charts, or any of the other items comprising this program, should write directly to the Educational Service Department, Behr-Manning, Troy, N. Y. This department has been established as a result of the marked interest of industrial-arts instructors in the preceding four units, and all requests for further information of any nature on the subject of coated abrasives should be addressed accordingly.

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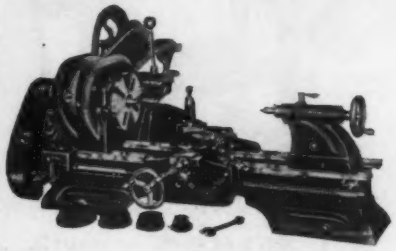

The "preview" folder which this firm has issued, also contains pictures and brief descriptions of all new Atlas 1939 machine tools and shop equipment. These will be covered completely in the Atlas General Catalog No. 39 to be released during November. Copies of Catalog 39 can be reserved by writing Atlas Press Company, Dept. 7, Kalamazoo, Mich.

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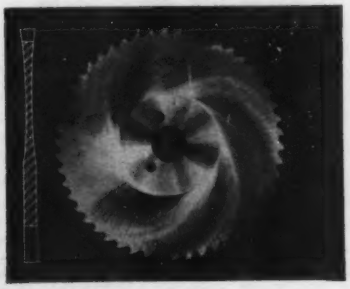

metal milling or slitting saw shown in the illustration, for instance, may be used on any type milling machine for cutting ferrous and nonferrous metals to the hardness of cold-rolled or chrome-nickel and tool steel. Tests have proved that extremely unusual cuts at high speeds can be made without burning the material or heating the saw rim.

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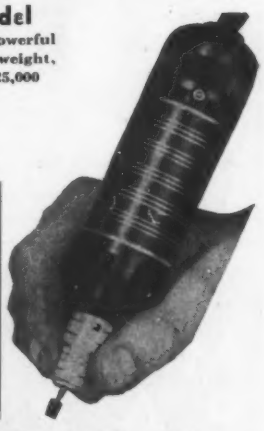

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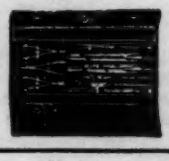

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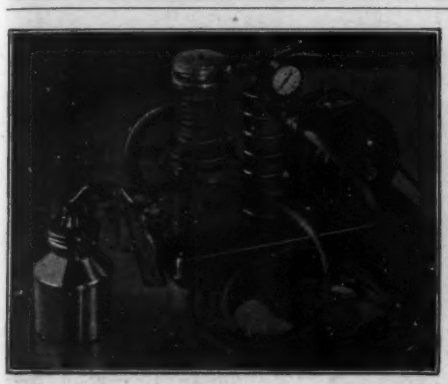

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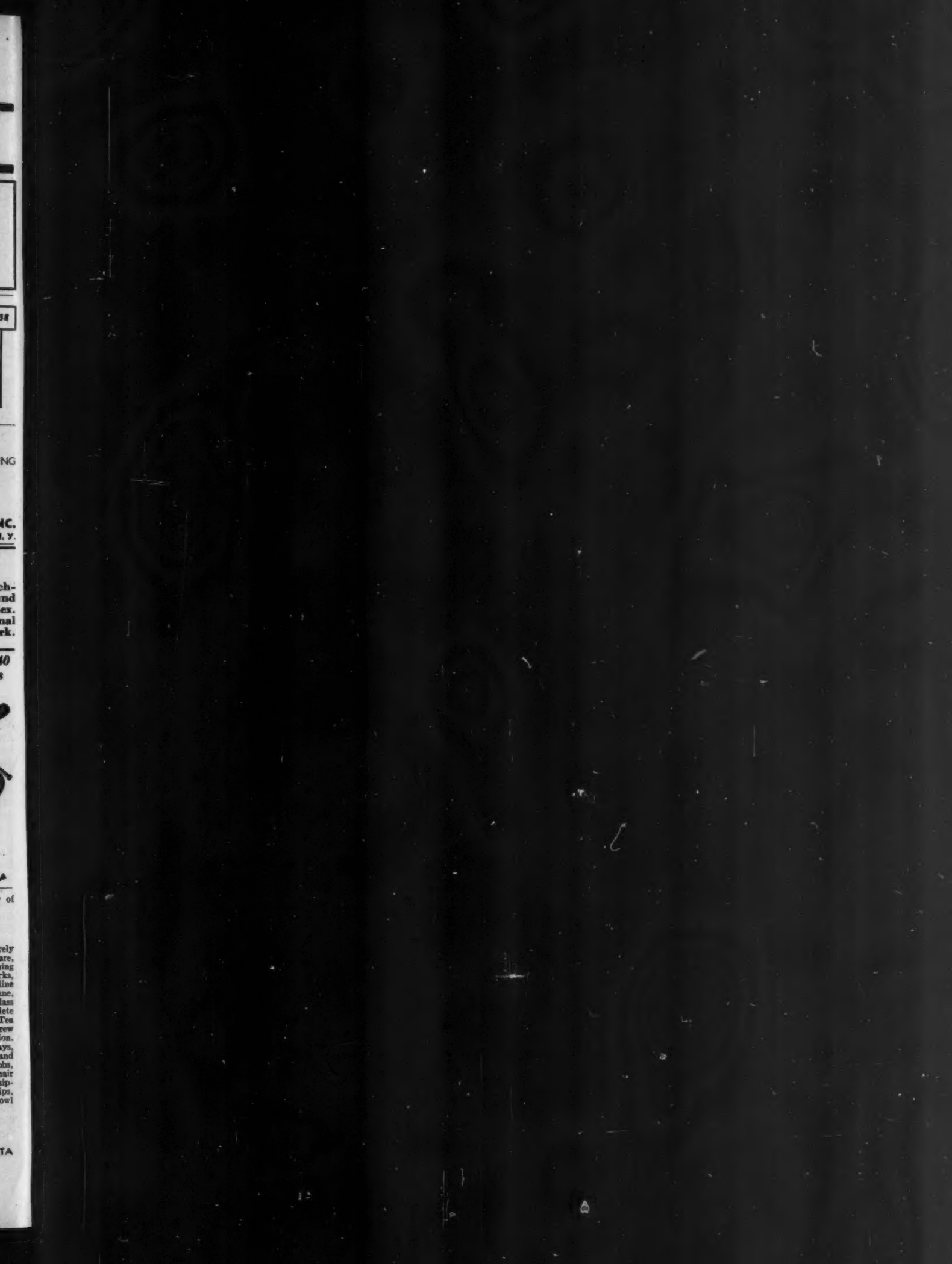
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